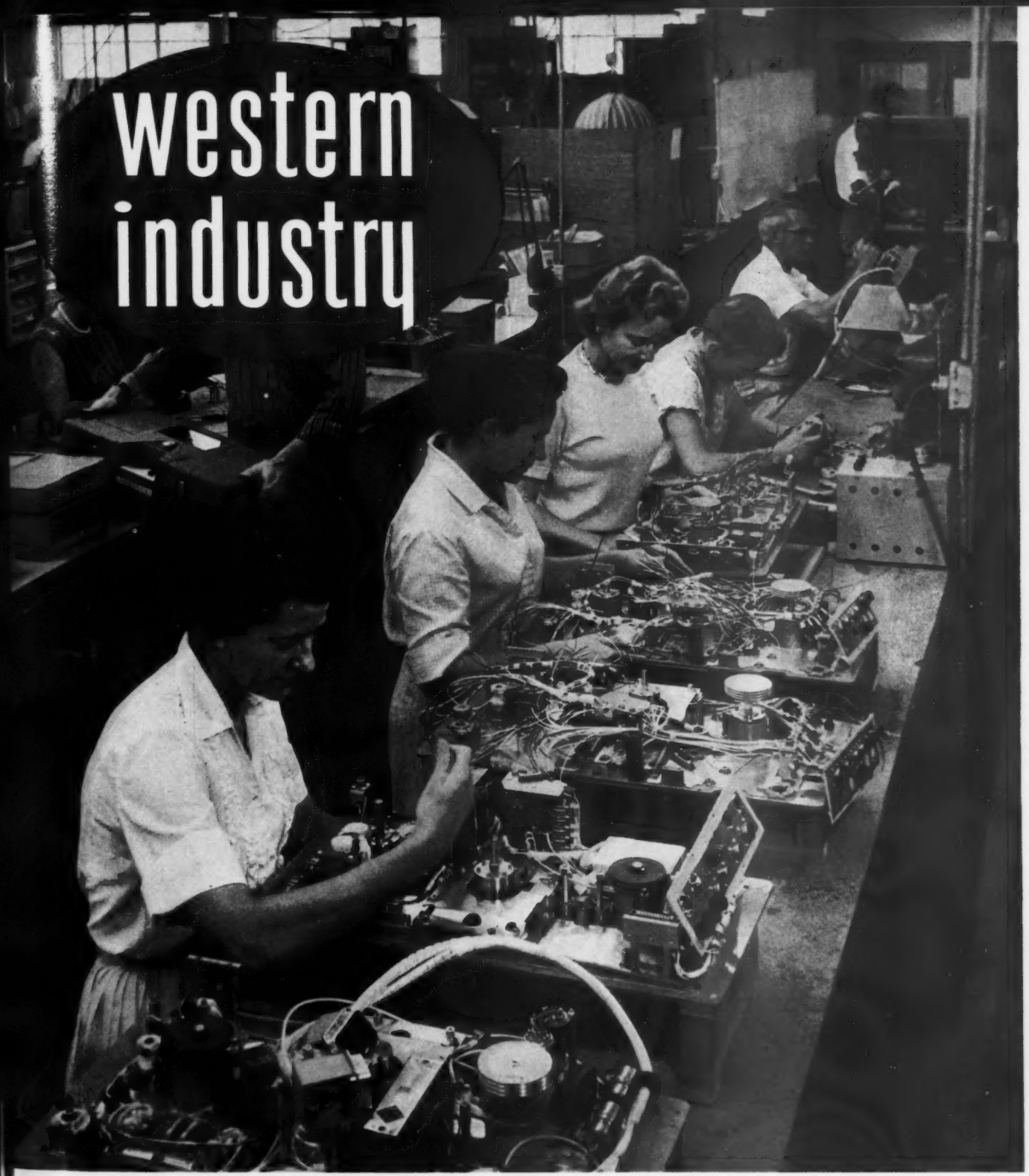
# western industry



NOVEMBER 1959

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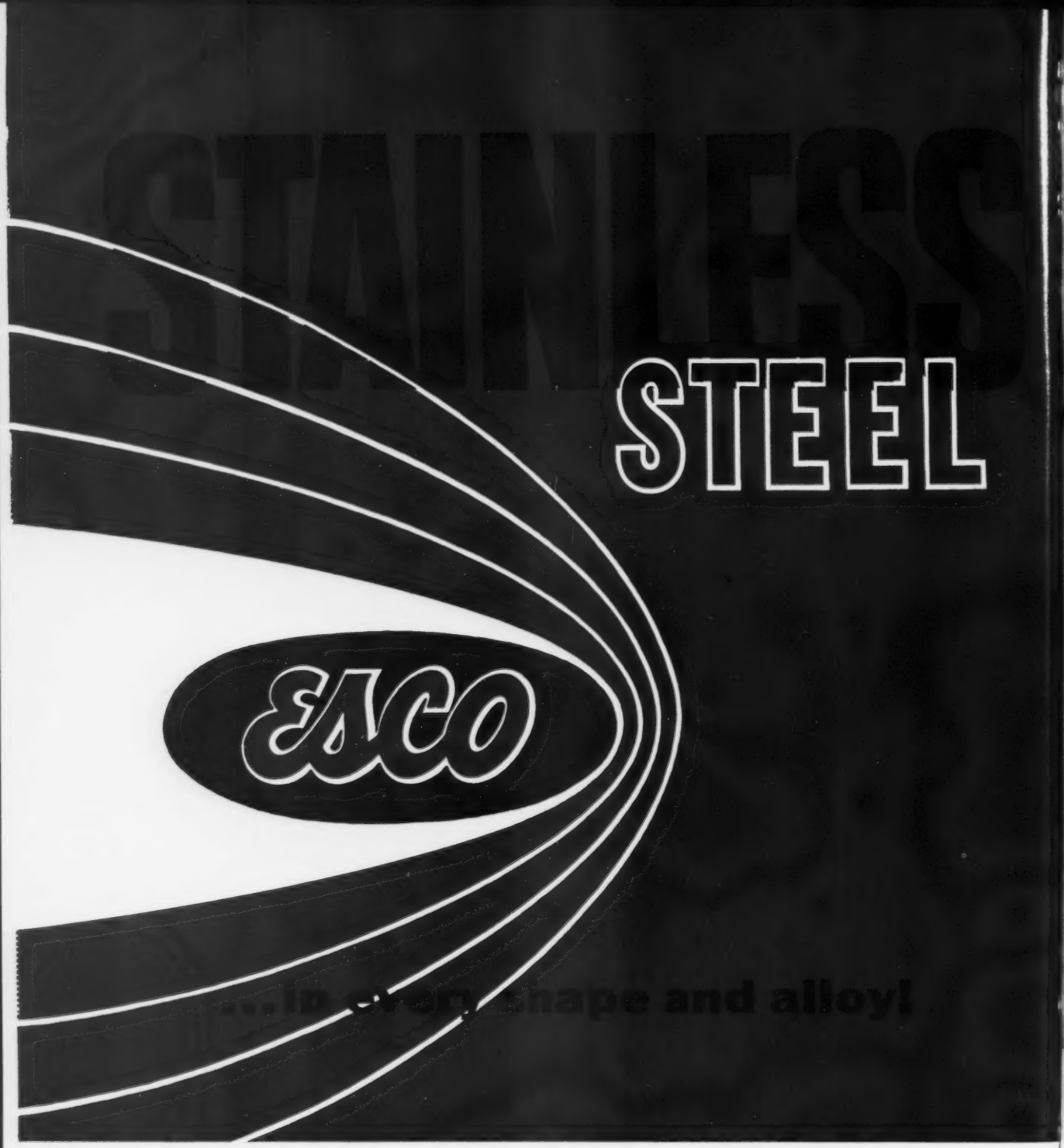


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Flash-Tite boosts production, cuts packaging costs several ways: It grabs faster, stays sticky longer. It eliminates tail end curl problems. It's usable to the last inch. And Flash-Tite's great pliability gives a tight, permanent seal to sharp corners and rough edges.

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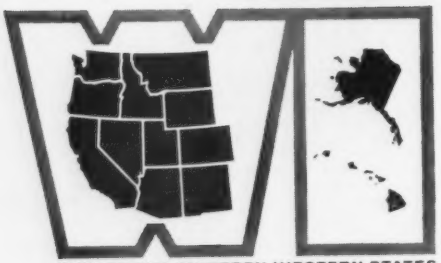
Volume 24 No. 11

# western industry



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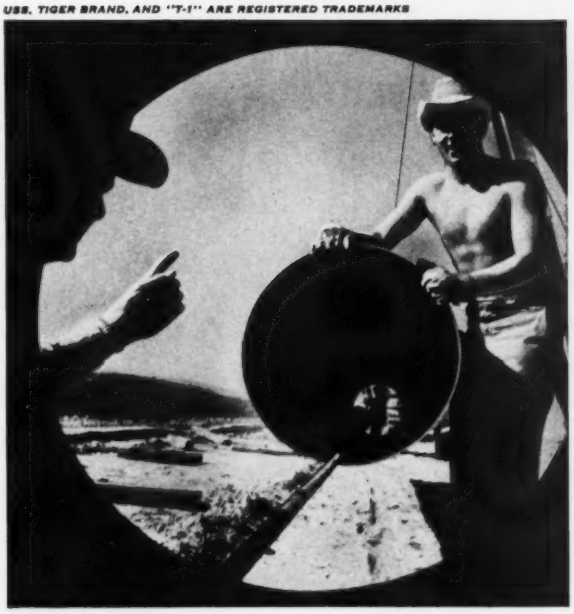
# Westerners like these new ideas in USS steel

USS, TIGER BRAND, AND "T-1" ARE REGISTERED TRADEMARKS



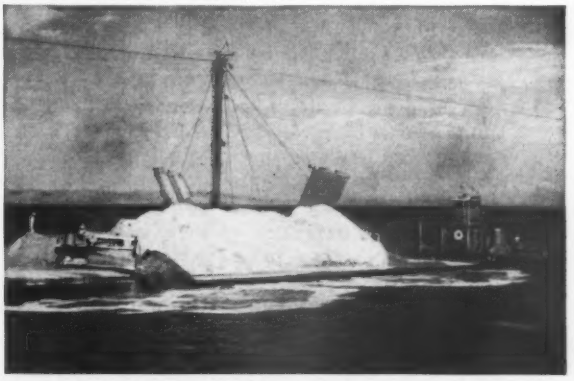
**New Pipelines for Progress.** From vast, underground reservoirs in the Southwest, giant pipelines bring the bounty of natural gas to the booming West. On projects like this Pacific Northwest Pipeline Corp., of Salt Lake City depends on USS Line Pipe, consistent choice for the toughest line pipe jobs throughout the West.

Contractor: Geo. E. Teufel Co.
Associated Architects: Bindon and Wright, and Decker, Christenson and Kitchin

**New Weather Profit for Walls.** No painter, scraper or sand-blaster needed for porcelain-enameled steel walls—seasonal rains can keep them clean. Think of the savings in maintenance! Shining example: Seattle City Light Building, in ageless porcelain-enameled panels formed from USS Sheets by Fentron Industries, Inc., Seattle, Washington.

**New Speed for Logging.** This year, modern logging methods will harvest some 16-billion board feet of Western timber and sinews of steel will carry the load! Western loggers rely on USS Tiger Brand Wire Rope for top-quality, specialized ropes of steel, designed for every logging application in every Western state.

Contractor: Morrison-Knudsen Company, Inc.



**New Strength for "Mountain-movers".** For the Southern Pacific Company's new 13-mile causeway on Great Salt Lake, five giant flat-top barges moved a mountain of fill on decks of USS "T-1" steel—45,480,000 cubic yards of sharp, abrasive rock, sand and gravel. Wherever earth is moved in the West, "T-1" is tops for equipment stamina and longer life.

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If production problems are eating into your profits, ask your nearby United States Steel representative about expert metallurgical service—with no obligation of course. This is only one of the many extra advantages of calling United States Steel.

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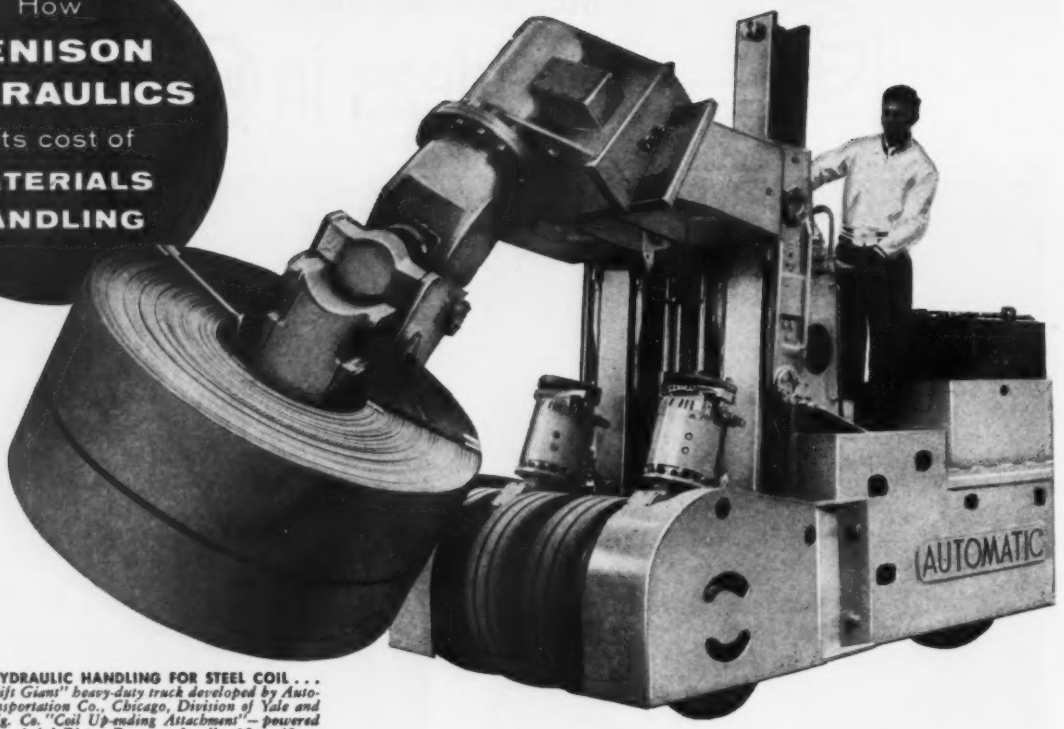
How
**DENISON HYDRAULICS**
cuts cost of
**MATERIALS HANDLING**




**SPEEDY HYDRAULIC HANDLING FOR STEEL COIL . . .** *on a "Skylift Giant" heavy-duty truck developed by Automatic Transportation Co., Chicago, Division of Yale and Towne Mfg. Co. "Coil Up-ending Attachment"—powered by Denison Axial Piston Pumps—handles 10 to 40-ton loads of steel coil.*

# AUTOMATIC® trucks handle steel coil like a baby . . . faster, safer with DENISON hydraulic power

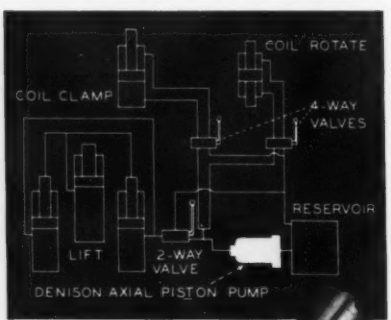
HERE's the business end of a "Skylift Giant" industrial truck—equipped with a special "Coil Up-ending Attachment". Its jaws easily heft rolls of coiled steel weighing from 10 to 40 tons . . . *with Denison hydraulic power that pays off in smoother, faster, safer handling.*

In leading mills—these heavy-duty trucks speed handling and storage without damaging coils. The Coil Up-ending Attachment is designed to enter the coil's inside diameter with a fixed ram . . . while the outside is gripped by a powerful hydraulic clamp. This clamp-and-ram design prevents "telescoping" of coils during handling.

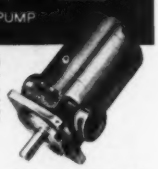
Three hydraulic cylinders—powered by motor-driven Denison 3000 psi Axial Piston Pumps—furnish lifting and clamping power. All three cylinders are connected hydraulically in parallel which results in a telescopic-cylinder action—but has the added advantage of retaining equal force and speed throughout the stroke at constant pressure and delivery.

*Result:* operator easily controls lowering speed at any level . . . and can inch the load up from extremely slow speed to maximum for which the flow control is set. *Safe, fast, smooth hydraulic control helps keep "Skylift" trucks continuously on the job . . . handling extra payload.*

Here's the kind of job your Denison Hydraulic Specialist can help *you* do *now.* Call him in soon . . . see how Denison hydraulic power can help put *more payload* into *your equipment.* Write us for details.




**HYDRAULIC CIRCUIT DIAGRAM** . . . *illustrates system for powering "Coil Up-ending Attachment". Denison equipment delivers hydraulic lifting and clamping power.*



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**American Brake Shoe Co.**
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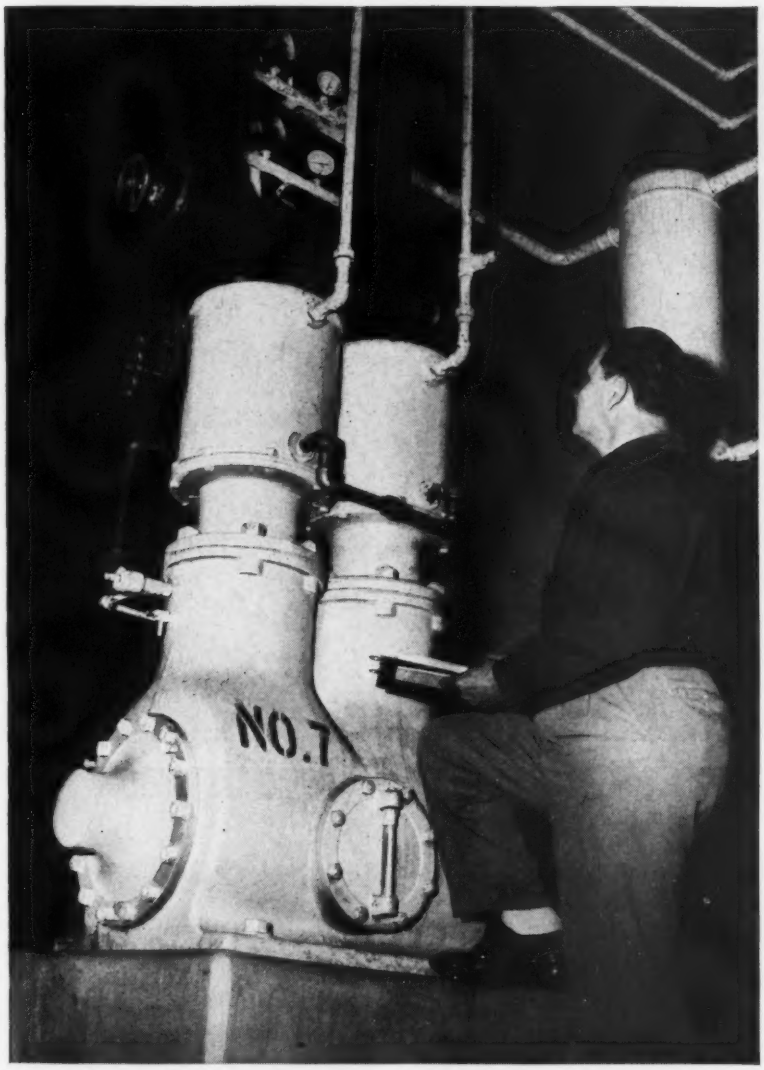
STANDARD ENGINEER'S FIELD REPORT

PRODUCT **Chevron Multi-Machine Oil ICH**

FIRM **Roma Wine Company Fresno, California**

# Compressor in service 10 years without repairs




**This 40-ton Cyclops Ammonia Compressor** is still operating efficiently after more than 10 years' continuous service using Chevron Multi-Machine Oil ICH (formerly Calol). Maintenance superintendent Joe Kovacevich, who is reading head and back pressure gauges (above), reports compressor has not required any repairs during this entire time.

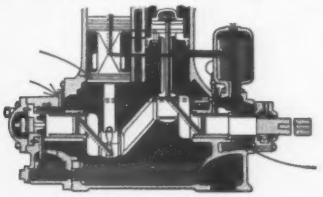
**Chevron Multi-Machine Oil ICH** is also used in winery's 12 other compressors. These refrigerate wine to accelerate aging and solidify impurities to permit filtering. Valves in compressors occasionally need grinding or replacement, but lower assemblies average 7 to 8 years of almost continuous service before needing repairs of any kind, reports Mr. Kovacevich.

CHEVRON Industrial Lubricants

TRADEMARK "CHEVRON" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

**Blower Units** keep oak casks at 45°F to hasten aging of wine. Compressor using Chevron Multi-Machine Oil ICH (described at left) serves three of these Niagara blowers.

## Why Chevron Multi-Machine Oil ICH reduces maintenance on bearings, pumps and compressors



- Resists formation of deposits; has extremely low pour point
- Metal-wetting ability keeps oil on bearings under heaviest loads
- Separates rapidly from water and contaminants
- Assures efficient seal of stuffing box glands

**For More Information** on this product or a copy of the new free catalog: "A Lubricant Reference Guide to Economical Equipment Operation," call your Standard Engineer or Representative, or write 225 Bush St., San Francisco 20, California.

**STANDARD OIL COMPANY OF CALIFORNIA**

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*A REPORT TO MANAGEMENT ON HOW*

# Industry cuts costs with FIR PLYWOOD

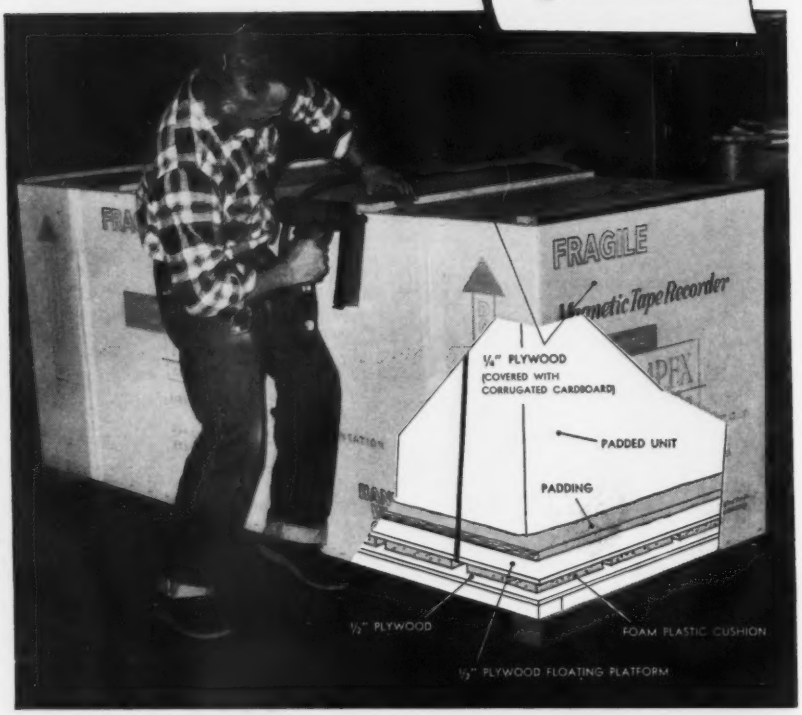
ROUTE TO:

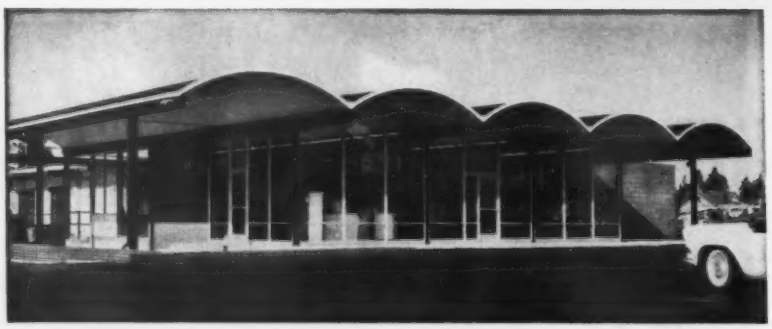
- ☐ ENGINEERING
- ☐ PRODUCTION
- ☐ SALES
- ☐ PURCHASING
- ☐ MAINTENANCE
- ☐ CONSTRUCTION
- ☐ _____

**Prize Package**—This unique fir plywood shipping container features a free-floating inner floor that virtually eliminates in-transit damage to delicate electronic equipment—yet it costs and weighs only half as much as the bulkier crates it replaces.

Adapted by Ampex Corp., Redwood City, Calif., from a system developed by North American Aviation, the container was an award winner at the packaging competition recently conducted by the Society of Packaging and Materials Handling Engineers.

Termed "free floating suspension" packaging, the system is keyed to a foam plastic-supported fir plywood platform to which the padded lading is securely strapped. Sides, top and bottom of the crate itself are also fir plywood. Plywood construction provides strength and rigidity without the penalty of extra weight, gives maximum impact and puncture resistance, and also simplifies fabrication and assembly.



**Fir plywood vaulted roof components** helped hold overall construction costs to $8.10 per square foot on this new Redi-Gas office-display-warehouse building in Tacoma, Washington. The multiple arch roof is composed of curved stressed-skin panels (each four feet wide and spanning 16 feet) which combine roof decking, finish ceiling and insulation. In addition to reducing on-site labor by as much as 80 per cent, the curved roof components permit large clear floor areas, spanning 16 feet without supplementary support from purlins or trusses. Each panel consists of Exterior fir plywood top and bottom skins glued to light lumber framing.

**Plywood patterns** help save hundreds of dollars monthly at Ryan Aeronautical Co. Fir plywood is cut to exact shapes of parts to be obtained from metal sheets and arranged for optimum cutting. Polaroid camera prints are rushed to production crews within minutes after the layout is approved.

**FOR MORE INFORMATION about fir plywood—its uses, properties and advantages—write**

**DOUGLAS FIR PLYWOOD ASSOCIATION**

**TACOMA 2, WASHINGTON**

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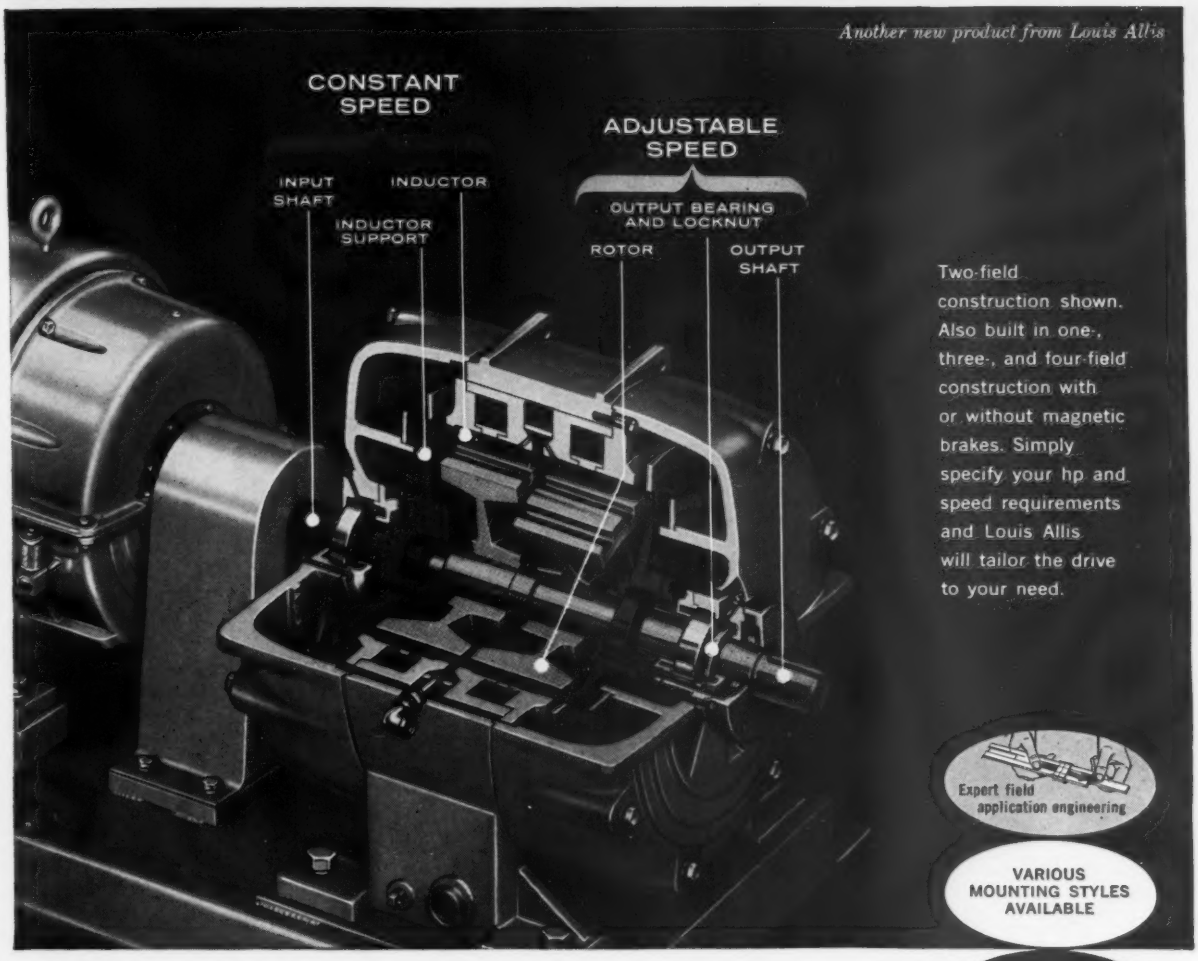
*Another new product from Louis Allis*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Based on a liquid-cooled magnetic coupling design, the *all-new* Louis Allis Magnetic Drive offers you the finest in precise regulation, compactness, and design flexibility for adjustable speed drives up to 2000 hp.

A unique annular cooling manifold provides effective heat transfer. It eliminates "water-drag" since there is *no* liquid in the air gap between the constant-speed and adjustable-speed members. There's no "flooding" the Magnetic Drive or forcing of water into bearings. And you'll *never* find condensation in the bearings. The reason: a planned flow of air through the drive reduces bearing temperatures and exhausts any condensation which might occur as the unit cools off after use.

Stationary field construction eliminates slip rings. All bearings can be lubricated without disassembly, and grease chambers provide ample grease reservoirs. Coils and lead connections are encapsulated in a chemical- and heat-resistant polyester — and simplified construction eases inspection and servicing. The *all-new* design permits simple relocation of cooling inlet, conduit box, discharge, etc., regardless of direction of rotation.

If your plans call for adjustable speed drives — specify Louis Allis Adjustable Speed Magnetic Drive. Write for a copy of Bulletin 3650 — now available at your Louis Allis District Office, or from The Louis Allis Co., 438 E. Stewart Street, Milwaukee 1, Wisconsin.

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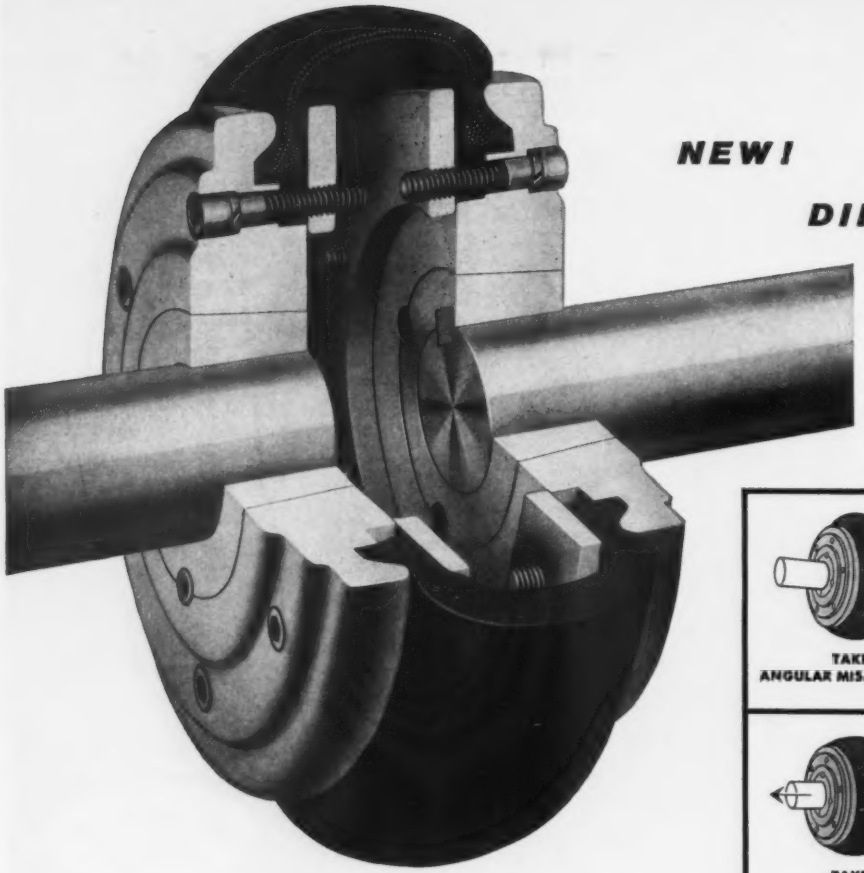
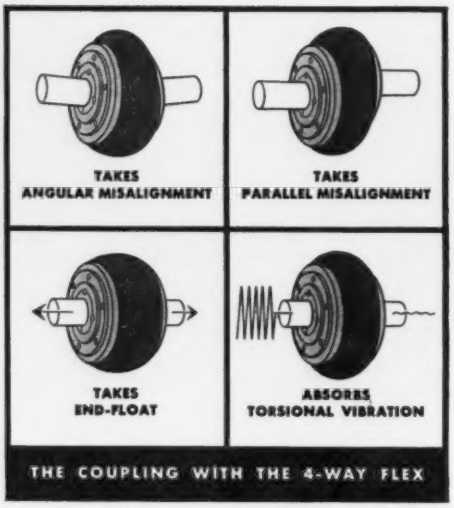


**NEW!**

**DIFFERENT!**




**DODGE**

# Para-flex

## FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 2000 hp at 1080 rpm. Call your distributor for a coupling to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 6600 Union, Mishawaka Ind.

**DODGE**

*of Mishawaka, Ind.*

**CALL THE TRANSMISSIONEER**—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

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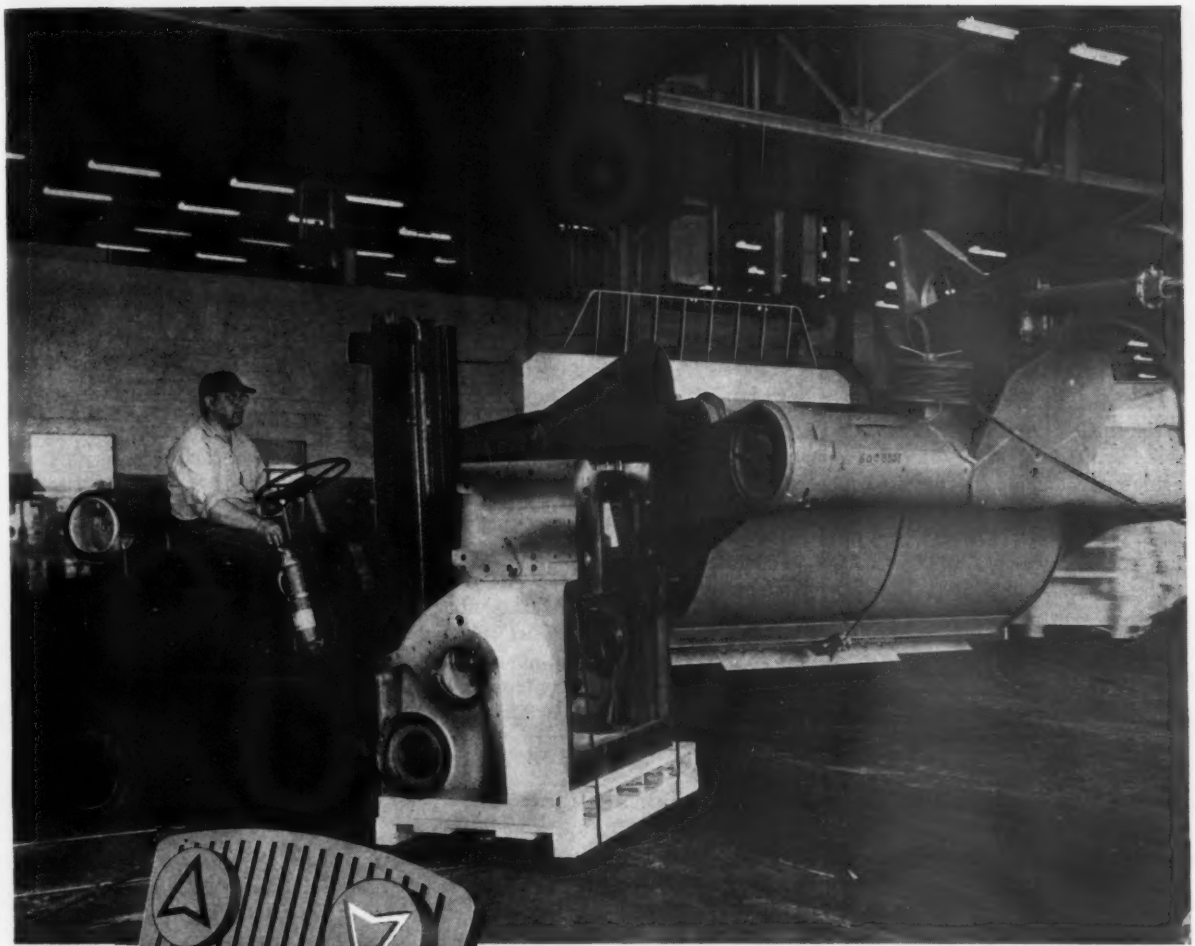
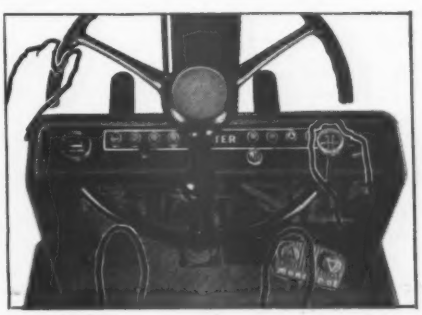


# Hyster® monotrol Trucks improve handling for Caterpillar Tractor Co.

To increase capacity for handling parts and sub-assemblies, Caterpillar Tractor Co. has new Hyster lift trucks with Monotrol control systems on the job at its Joliet, Illinois plant. Two units, 4,000 and 5,000 lbs. capacity, maintain a schedule in shuttling loads between storage areas and production lines. Result: handling operations are faster, driver fatigue is reduced, safety factor improved.



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# western meetings

## Technical Papers Winners Announced

WINNERS of the 1959 Technical Papers Contest sponsored by the Southern California Chapter, Society of Packaging and Handling Engineers have been announced. First place award of $100 goes jointly to M. J. Peterman and R. S. Nelson, Rocketdyne Div., North American Aviation, Inc. for a paper entitled "System for Standardizing Containers by Use of Modular Panels." Second place winner is W. G. Lawrence, Boeing Airplane Co., with his paper, "The Reusable Container as an Integrated Materials Handling Device." J. L. Krager, Jr., Radio Corporation of America is third place award winner for his paper on "Package Design—Basic Principles."

Judges were: Harry Himmelblau, Balt, Baranek & Newman; Ken W. Brown, Space Technology Laboratories; R. R. Jansen, North American Aviation, Inc., Los Angeles Div.

## 1960 Western Tool Show

THE THIRD WESTERN Tool Show to be sponsored by the American Society of Tool Engineers will be held November 14-18 in Los Angeles in the newly completed Memorial Sports Arena. The Arena has an area of 195,850 square feet of floor space. Some 15,000 manufacturing executives and engineers are expected to visit the show and see its approximately 250 industrial exhibits.

## Material Handling Society President Visits San Francisco

STEPHEN C. TRAUDT, national president of the American Material Handling Society, Inc., addressed the Northern California Chapter of AMHS on November 5 in San Francisco. He discussed the material handling engineer's role in effecting a working relationship with all members of his concern from floorsweeper to president. This involves use of psychology and a complete analysis of the problem and individuals who should be concerned with its solution. Also brought up was how,

through proper relationships with employees, to sell them on the theme of working smarter and not harder, thereby eliminating back breaking toil as well as effecting a good union-management operation.

## WESTERN INDUSTRY Has New Editor

Murat Boyle has been appointed editor of WESTERN INDUSTRY starting with the December issue.

He has been editor of DETROIT ENGINEER for the past five years, before that was associate editor of PRODUCTION, and a methods engineer at National Twist Drill & Tool Co. He is a graduate of Williams College.

He brings to WI's readers a rich background as a writer, editor and engineer. His appointment assures you, the reader, that WI will continue to keep you informed—even more fully than before—of significant developments which can guide you to more profitable manufacture and plant operation under Western conditions.

*Robert C. Johnson, Publisher*

## ASTM Holds Pacific Area Meeting

SOME 200 TECHNICAL MEN and executives from industry, government and educational institutions attended the American Society for Testing Materials 3rd Pacific Area National Meeting, October 11-16 at the Sheraton-Palace in San Francisco. Over 250 papers were presented in more than 50 technical sessions. Feature speaker at the conference was Lt. General Bernard A. Schriever, head of Air Research and Development Command, U. S. Air Force.

Paul V. Garin (left), Head of Research and Development for Southern Pacific, San Francisco, discusses the demands of industry, and Western industry in particular, for new materials with F. L. LaQue, ASTM President. Garin served as Chairman on the ASTM General Committee on Arrangements for the conference. Other Westerners serving as committee officers now shown here include: P. E. McCoy, Vice Chairman, American Bitumuls & Asphalt Co., San Francisco; M. B. Niesley, Vice Chairman, California Testing Labs., Inc., Los Angeles; H. P. Hoopes, Secretary, Fiberboard Paper Products Co., San Francisco; L. A. O'Leary, Treasurer, W. P. Fuller & Co., South San Francisco.

According to F. L. LaQue, ASTM national president, who attended the conference, Western industry is vitally interested in such materials, particularly those in use in aircraft and missile plants, and in modern high pressure, high temperature steam power plants. He stated that as time goes by it will find new uses for materials now being developed primarily for defense only. The using of these new materials to advantage can only be assured by uniform methods of testing.

. . . continued on page 14

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## Important Metallurgical Conference in 1960

THE METALLURGICAL SOCIETY of the American Institute of Mining Metallurgical and Petroleum Engineers has announced a conference on "The Response of Materials to High Velocity Deformation" to be held in Estes Park, Colorado, on July 11-12, 1960.

The subject is of particular importance to Western industrial and technical men since it covers an area in which many materials, formerly considered unfabricable, can be worked. For instance it has been found recently that some metals such as molybdenum that are otherwise brittle and all but unworkable, can be extruded successfully if done under essentially explosion loading rates. When properly subjected to shock waves, metals may essentially, without plastic deformation, be hardened as much as if they had been plastically deformed 95%. High-velocity deformation techniques have been adopted to form large forgings, form large sheet metal components, and harden selected parts of components heretofore regarded as essentially unfabricable.

The conference plans to consider the crystallographic, metallographic and basic metallurgical phenomena that occur in metals under high strain rate. It will not be concerned with explosive forming methods. Purpose of the conference is to exchange information developed but not published, bring together the leading men in the field and compile in one publication a summary of the most important current research programs in the field. The proceedings will be published in cooperation with Interscience Publishers, Inc.

## Trucking Convention Speakers Predict California Industrial Boom

TWO VICE PRESIDENTS of the B. F. Goodrich Tire Co. speaking at the American Trucking Association's convention in Los Angeles, October 19, called California a "giant on wheels" and predicted that it will soon lead the rest of the nation in the greatest surge of business growth this country has ever seen.

The two men, Guy Gundaker Jr., vice president, replacement sales, and John T. Callahan, vice president, equipment sales, said that while the 1960's will be a period of unprecedented growth for the entire country, California's business outlook is even rosier. A big factor in this is the tremendous increase in the state's young adult population which will occur in the late 1960's and bring about a staggering increase in the state's commercial and industrial markets.

## Sheet Metal Group Elects Officers

NEW OFFICERS of the Sheet Metal Contractors Association of Southern California are: Marlowe C. Hodge, president; Edward Banks, vice president; and H. D. Shaner, secretary-treasurer. The men were elected at a recent meeting of the association and will serve a one year term. Hodge is president of the Hodge Sheet Metal Works, Los Angeles.

## Western Plastics Conference

HUNDREDS OF REPRESENTATIVES of the mushrooming Western plastics industry gathered in Los Angeles last month for a two-day conference covering recent developments in this, the newest of the billion dollar industries on the West Coast.

More than 500 scientists and engineers represented firms employing more than 100,000 persons in Los Angeles County alone.

Predicting that the Western plastics industry, that last year produced some 10% of the national gross product in plastics, $2,272,000,000, will double in size in the next decade, Albert E. Forster, president of the Hercules Powder Co., cited the industry for progress in reaching from "Billiard ball to outer space."

The Hercules president pointed out that predicted expansion would result from the rapidly increasing use of plastics in autos, building materials, furniture, aircraft, packaging, bottles, and scores of other industrial applications.

He explained that the first major use for plastics was in billiard balls and that today, Explorer VI, "the paddle wheel satellite" and the recently successful Vanguard, utilized plastic cases to house the solid propellants.

Left to right, Thomas Bissell, Executive, Society of Plastic Engineers; Fred C. Sutro, Spencer Chemical Co. and National President of SPE; A. E. Forster, President, Hercules Powder Co.; Russell Weigel, du Pont Co., discuss the phenomenal growth of plastics and their uses in the West in just 20 years time. SPE conference was held in Los Angeles at Ambassador Hotel. In foreground on table are plastic honeycomb and molded specialty items.

Key conference events included luncheon speeches by William Zisch, vice president, general manager of Aerojet General Corp., and Dr. Lewis Larmore, chief scientist of the Lockheed Corporate group.

In addition, more than 24 papers on plastics were presented ranging in scope from fluidized bed coatings to epoxy molding compounds.

Conferees included members of the Society of Plastics Engineers and the Society of the Plastics Industry, the two principal technical organizations in the industry.

According to Jack Fuller, Society of Plastics Engineers, and chairman of the technical conference, more than 2,000 plastics firms operate in the West and range in size from one-man shops to 1,000 employee operations.

"Strongly oriented to the military following World War

. . . continued on page 16

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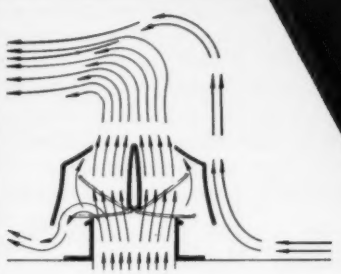

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**RECENT INSTALLATIONS**—General Controls Inc., Glendale; Rexall Drug Store, Ventura; Almond Growers Exchange, Sacramento; American Electronics Co., El Monte; Hammond Furniture & Fixture, Los Angeles; W. J. Sloane Co., San Francisco; Continental Airlines, Inc., Los Angeles; Harvey Aluminum Co., Torrance; North American Aviation Co., El Segundo.

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(continued)

II, the industry now boasts diversification that takes synthetics into every phase of Western manufacturing," he said.

Many of the industrial and consumer developments in plastics are attributed to two main types of plastic, polypropylene and high density polyethylene.

Main roadblock to plastic use is acceptance of industry and government. For example, spokesmen pointed to use of plastic plumbing, highly developed in Europe for domestic and industrial use, but hampered in this country by discriminatory building and industrial codes.

## Material Handling Show & Packaging Cavalcade

THE 3RD WESTERN Regional Material Handling Show & Packaging Cavalcade, which will take place May 11-13 in Los Angeles has been greatly increased in scope and now in every sense has become a three-in-one event.

Already sponsored by the L. A. Chapter of the American Material Handling Association and endorsed by the Material Handling Equipment Distributors Association, the show has now been endorsed by the Southern California Chapter, Society of Packaging and Handling Engineers under President Noble W. Jones.

SPHE has set up a special show committee headed by H. L. Walters, Radio Corporation of America, which is now in communication with leading handling, packaging and shipping firms. SPHE will lend active support in drawing attention of packaging-shipping and handling producers to the forthcoming event.

According to W. B. Semco, Los Angeles Chapter president, AMHS, which is the show's sponsor, the show committee is receiving applications and inquiries on exhibit space at a rate much greater than either of the two previous shows.

**PURCHASING AGENTS CONVENTION**—The International National Association of Purchasing Agents have selected the Hollywood Palladium for their 45th annual Convention and Inform-A-Show, starting May 22, 1960. According to E. Benton Long, Convention Chairman and Purchasing Agent for United States Lime Products Division, The Flintkote Co., Los Angeles, the starting event will be the Early Birds Dinner with the underlying theme, "A Night in Hollywood."

## Instrument Society Elects Westerner

JOHN J. McDONALD, director of engineering, Consolidated Systems Corp., has been elected a vice president of the Instrument Society of America. He will direct ISA activities in California, Hawaii, Arizona, Nevada and part of Utah during his two year term of office.

## Californians Win American Society for Metals Awards

FOUR WESTERNERS are among those selected by the American Society for Metals to receive that society's 1959 major honor awards.

The ASM Medal for the Advancement of Research has been presented to John Leland Atwood, president of North American Aviation, Los Angeles. Under his leadership the corporation has led in the development of chemical milling and electrochemical milling, and pioneered in the use of titanium and in such advanced forming methods as "explosive forming."

Winners of the Howe Award, oldest medal award for scientific achievement, are John E. Dorn, professor of metallurgy and Frank E. Hauser, assistant professor of mechanical engineering, both of the University of California at Berkeley, and Phillip R. Landon, research metallurgist at UC's Lawrence Radiation Laboratory, Livermore, California. They received the honor due to their joint authorship of a research paper on "Deformation and Fracture of Alpha Solid Solutions of Lithium and Magnesium."

## "Plastics in Packaging" Meeting

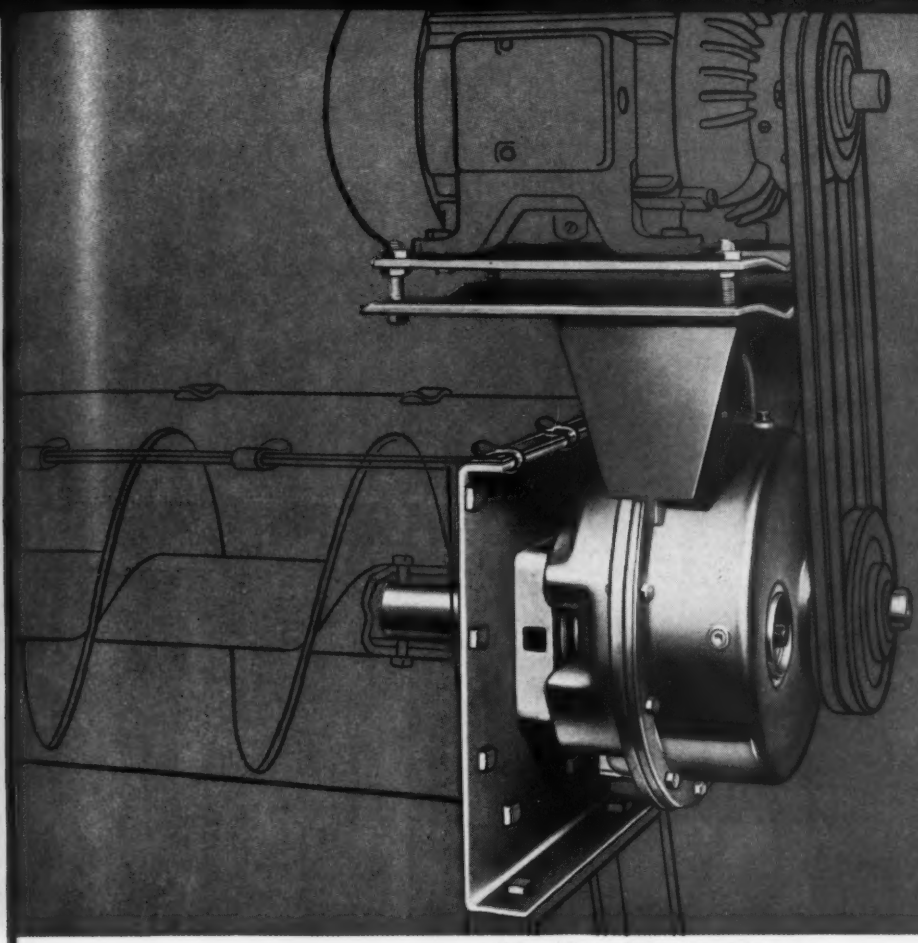
TOP EXPERTS from two industries, plastics and packaging, are coming to Berkeley from all parts of the country to present their papers at a one-day meeting that will give those attending the latest and best information available on plastics in packaging. Whatever your interest—containers, film, foam, fiber glass, design—there is something on the program for all.

Host of the conference is the Golden Gate Section of the Society of Plastics Engineer. Those interested are invited to attend. The conference will be held on November 19 at the Claremont Hotel, Berkeley. Information may be obtained from James C. Smith, Reichhold Chemicals, Inc., 120 S. Linden Ave., South San Francisco, Calif.

## Window Testing Reports to be Published

REPORTS OF TESTS completed at the University of California for the California State Division of Architecture will be published within the next three months. Purpose of the testing program is to analyze and test products to determine how to make public buildings safer in general and in particular to determine earthquake resistance of windows in relation to the amount of glass used.

Cooperating with the State Division of Architecture are the Western Architectural Metal Manufacturers. Member companies of WAMM provided products for the testing program and served as representatives and observers from industry for the tests.



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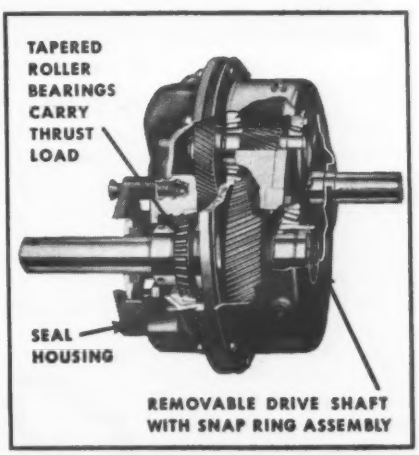


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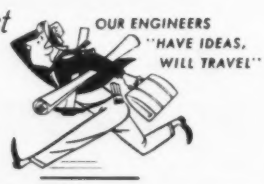


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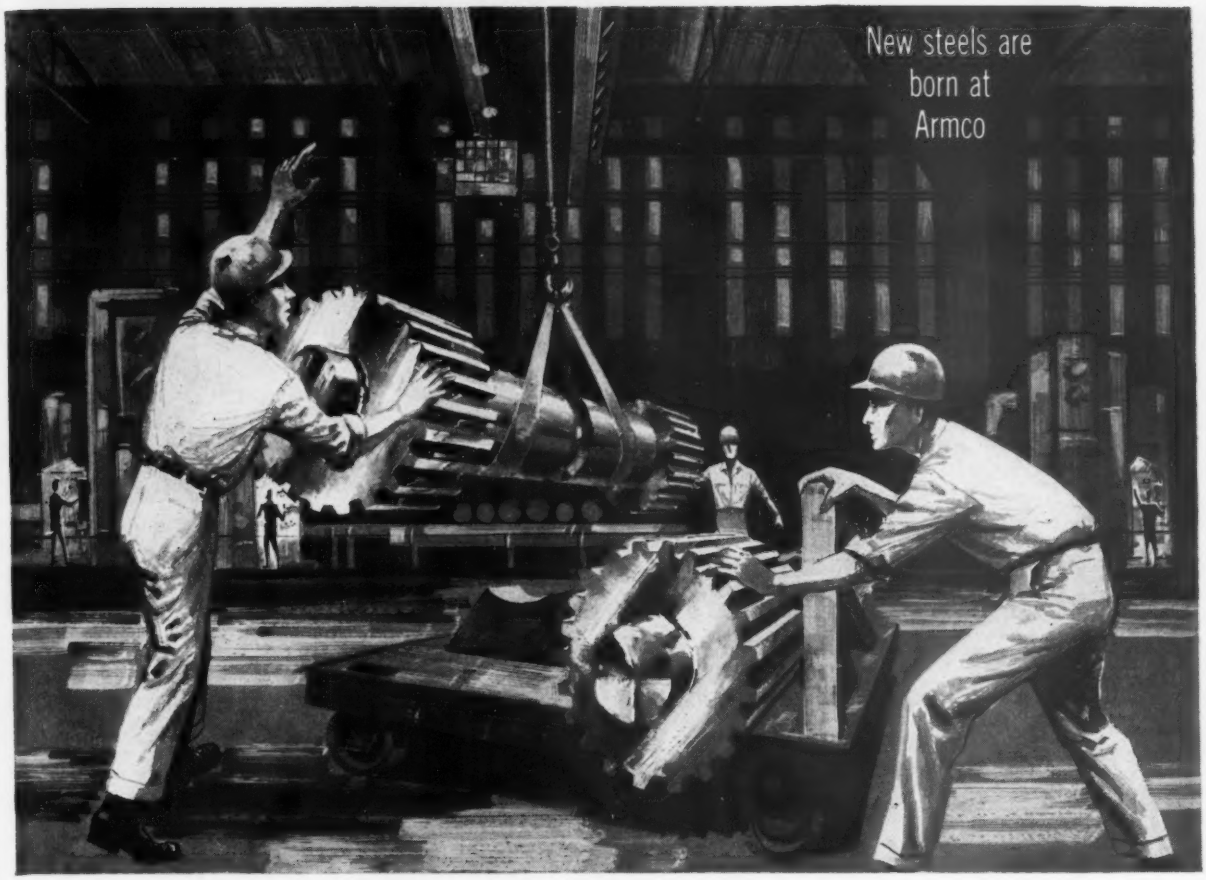


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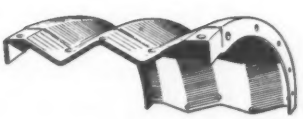

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31 / BUILDING

NOVEMBER 1959
Vol. 24 No. 11
western industry

# DATA RECORDING gives permanent reference

In many Western Industries new products need thorough, accurate testing before marketing. Use of electronic data recorders connected to testing instruments can cut costs by providing instantaneous permanent records.

THE TECHNIQUES of flight testing have advanced along with the techniques of aircraft design and manufacture. An elaborate system of instruments, pickups, data acquisition and telemetry equipment is built into prototype aircraft models to obtain information necessary for development engineers. Demands of competition make it necessary for a maximum of test data to be made available in the shortest possible time.

A recent instrument that has gained popularity for flight testing is the airborne magnetic tape recorder. The Convair 880 jet transport, for example, carries two Consolidated Electrodynamics Corp. Type 5-701 recorders during its flight testing. They are built by CEC's DataTape Division, Pasadena, Calif.

Each instrument records 14 channels of data along its one-inch-wide tape. Data from eight sources are time-shared on each channel, for a total of 112 data sources permanently and accurately recorded by each recorder.

During each phase of the flight test, phenomena are detected by sensors such as pressure pickups, accelerometers, strain gages, and thermocouples. These are amplified when necessary, and multiplexed by a CEC Plexicoder, which converts electrical signals into galvanometer light beams for commutation and coding, and reconverts them into pulsed signals. These signals are recorded and later played back by development engineers. An advantage of tape recorded data is that they can be played back into data processing and computer equipment. This saves considerable time in computing results of the test.

Included in the many tests being conducted on the new four-jet 880 before it is certified ready for commercial operation are flutter tests of the control system. In all, 300 hours of flight testing over a 10-month period were required for the control system alone.

Flutter is a mechanical oscillation of a flight structure, and can tear an aircraft surface apart if serious enough. To test the 880's flutter characteristics, two separate methods were used to induce flutter. A hydraulic inertial "shaker" in each horizontal stabilizer sets up sinusoidal excitation automatically or on command. The pilot also creates flutter in the control system by banging the control wheel, column or rudder pedal.

An assortment of pickups obtains data while the flutter test is in progress. Four accelerometers are located on wing spars, eight are on engine pods, six are on the tail, four on the horizontal stabilizer and two on the vertical stabilizer. Position transducers measure the movement of pilot's control wheel, column, and

*PLEXICODER COMMUTATES AND CODES signals from numerous sensors mounted throughout the vital parts of the plane undergoing flight test.*

rudder pedals; left and right elevator and elevator control tabs; horizontal stabilizer; rudder, rudder trim tab, and aileron control tabs; left and right aileron, aileron trim tab, and aileron control tab; left and right inboard and outboard spoilers; and wing flaps. Vibration pickups measure horizontal stabilizer shaker frequency and amplitude, and appropriate instruments measure airspeed, altitude and ambient temperature.

While this information is being recorded, certain key measurements are telemetered to the ground so that engineers can watch progress and results of the test on "quick look" display equipment. This is also a new concept in aircraft flight testing. Formerly, data had to be reduced and computed before results of each maneuver could be appraised. Sometimes it was not known until days later that a test had to be repeated, causing a delay in the time in which this information could be applied to the production aircraft. Besides, the pilot might have forgotten the feel of the controls during maneuver, and might repeat his error. By telemetering data to the ground and maintaining a voice communication link between the ground and the plane, engineers are able to monitor the maneuver while it is in progress, and tell the pilot what corrections are necessary.

Telemetered data is also recorded on the ground to back up the airborne recorder. If the aircraft were lost, the ground tape probably would have a record of the cause.

The shakers sweep through a specified frequency range at a programmed rate of sweep and force. The flutter test is made at selected speeds and altitudes. The results, when tabulated, create a picture of the flutter characteristics of the aircraft.

The end product of the data recorded for the flutter test is an oscillographic trace from which engineers can plot damping coefficients against airspeed, vibration and altitude. If more detailed computation of results is required, the tape output can be processed through an analog-to-digital converter and re-recorded at a speed compatible with the manufacturer's digital computer.

*FOURTEEN-CHANNEL DATATAPE airborne magnetic tape recorder preserves a record of data during the flight testing of the Convair 880. Recorder can be in plane or on ground during test.*

Airborne tape recorders such as those used in the Convair 880 development program are designed to record data faithfully during the extremes of environment encountered during flight testing. CEC's new 5-702, for example, operates at extreme temperatures, shock, vibration and altitude. Its size is only two cubic feet, and weight is 80 lbs., but it can record up to six hours of data at its slowest speed of 1⅞ in. per second.

# STRAINER CLEANED without stopping operation

## Pump strainer has externally operated scraper

TO INSURE clean water from San Francisco Bay in connection with large condenser water requirements, the Hunters Point Power plant has installed two scraper strainers ahead of the wash water pumps.

The strainer can be cleaned quickly without shutting off the water and without disassembling the strainer. Such features are especially important when the incoming water has a high percentage of debris or sea life (mussels, sardines, etc.).

A great reduction in maintenance man-power is achieved besides insuring against temporary shutdown due to clogged strainers.

The strainer installed is Sarco Co. type VRS. This features a spiral blade mounted on a rotor that can be revolved either manually or by motor drive. The blade scrapes the screen clear of collected solids which are blown down from the strainer as required.

Pressure drop is kept to a minimum because of the clean screens. The screen is arranged at right angles to the flow.

*PUMP STRAINER can be cleaned without stopping flow of water or disassembling. A scraper with spiral blade scrapes screen clear. Device may be operated by motor or manually.*

# METAL SPRAYING repairs shaft

## Job site repair for hard-to-move part

WORN AREAS OF ROTATING or sliding machine parts, shafts, plungers, and rams are being built up by metal spraying, finished to original dimensions and put back into service at lower cost than by other methods, according to Art Bender, Bender Machine and Engine, Los Angeles.

Bender is using Metco (Metallizing Engineering Co., Los Angeles) 420 Stainless wire and others including Monel, bronze, aluminum. Wire is drawn through a Metco gun to a nozzle where it is melted by oxy-acetylene or other gas flame and atomized by a blast of compressed air which carries metal particles to a prepared surface.

Hot particles hit the surface, stick, and are rapidly cooled by compressed air, thereby classifying metal spraying as a cold process that leaves work free from warpage or distortion.

Bender has brought a new twist to metal spraying by finding applications ranging from cannery equipment to Lance Reventlow's racing car brake drums. Major innovation is a mobile technique that is invaluable for job-site emergency repairs.

For example, a Los Angeles hotel operator was plagued with a faulty elevator shaft that was out-of-round .040-in. The shaft supported the drum on which the main elevator cable wound and unwound during use. Shaft wear caused severe bumping, making it impossible for passenger use. To remove the shaft would cost over $3000, required a crane. To allow access for the crane, an entire wall would have to be removed from the elevator motor room atop the hotel.

Bender Machine took a portable spraying unit to the site, moved the shaft only enough to expose the worn area. Metalspraying and finishing the shaft to press-fit tolerance restored the elevator to operation at about 1/10 the cost of other methods, and with considerably less confusion.

# SIMPLIFIED DESIGN

## permits automatic line

Changing a multi-part design into a single piece part drastically cuts plant production costs.

SIMPLICITY OF DESIGN in a mass produced item often leads to cost savings. Such is the case with a defense item, a 107-lb. Zuni air-to-ground rocket being produced by Bridgeport Brass Co., Hunter Douglas Division, Riverside, Calif.

Not only did Bridgeport engineers huddle with Naval ordnance experts from the China Lake California Test Station on Zuni design, but they created a 10-station automated production line that takes the as-extruded aluminum shape at the receiving end and turns out a finely machined rocket motor tube, ready for component assembly.

The unique facet of this particular project is the relationship between the Naval development team and a mass production corporation whose main business is not based on government contracts.

The Navy's Zuni type prototype indicated certain merit in design but the rocket motor tube was expensive to make, had many parts, and required tolerances that were difficult to hold.

They brought this cost and production problem to the Hunter Douglas research department that converted the multi-part design into a single piece item beginning with a cold extrusion.

Bridgeport then built an automated production line to economically produce the complete motor case. The basic extruded shape is made from high-strength Bridgeport aluminum alloy.

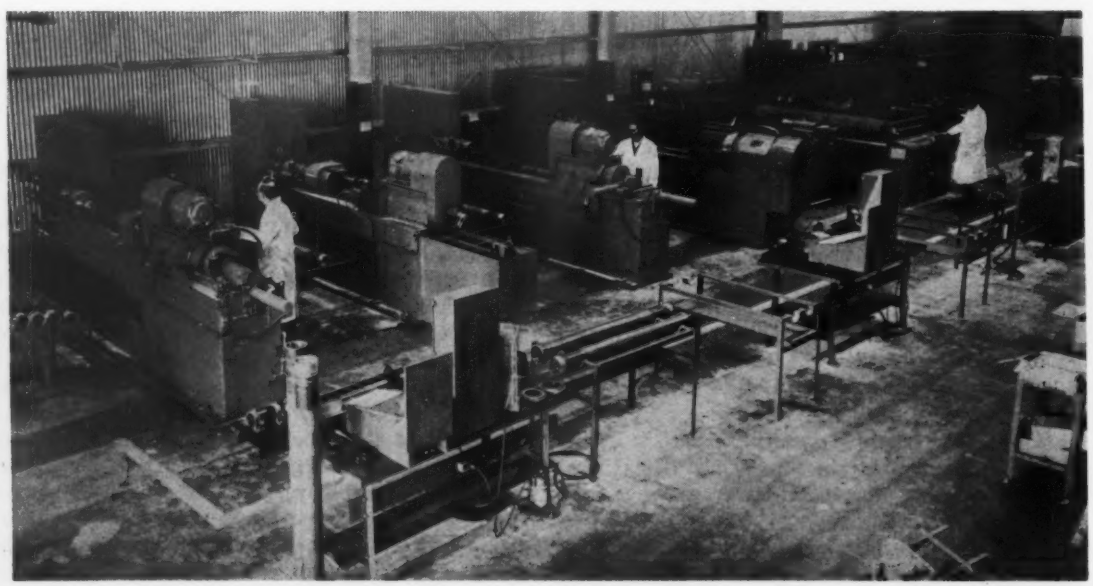
This is sent through the electronically operated continuous machining line and ends up a motor tube completely assembled except for propellant.

Among operations performed automatically are boring, machining of ID and OD to tolerance, pre-thread operations for fin and warhead attachment, threading, cleaning away of chips, coolants; drilling of holes for attachments, deburring of holes, threading of holes, and final cleaning operations.

Fins for the Zuni are also made at the Riverside facility using permanent mold casting techniques and Sanford process for protective hard coating, since fins are adjacent to motor exhaust areas.

Including fins, the 5-in. OD solid propellant rocket has only four moving parts.

*ZUNI ROCKET MOTOR CASES shown running through production line. Conveyor system brings tube beneath each station. It is then lifted into the machine and discharged to the conveyor when the operation ends.*



# SPECIAL RACKS

## to store in-process work

Specially made parts racks cost little, have many advantages and save 25% of the floor area over former methods.

**by Donn R. Claybaugh**
**Nor-Air Division, Northrop Corp.**

THE NOR-AIR DIVISION of Northrop Corp. is reaping rewards by using special racks to store or transport parts and work in process. These racks have generally been constructed of 2x4's, 4x4's and heavy plywood, with adequate padding of felt and canvas where required. They have been stressed sufficiently to allow their being moved by fork lift or skates for rearrangement purposes or to receive casters to provide portability.

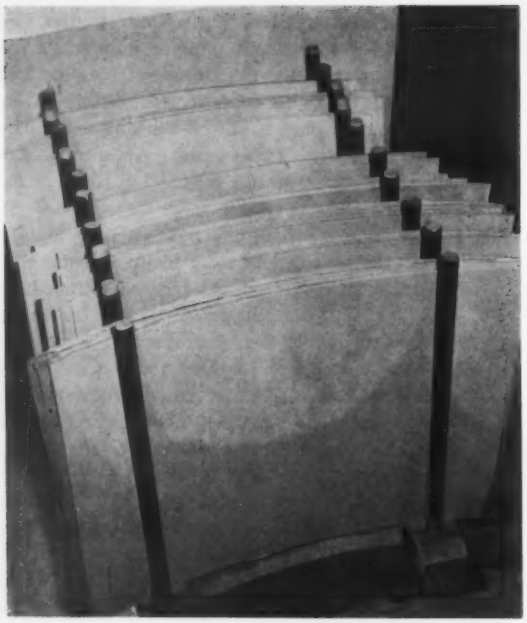
Recent developments are new applications and designs of "peg type" racks. As applied at Nor-Air the peg racks consist of two or three 4x4-in. posts secured either vertically or horizontally to the floor by angle iron brackets and tamp-in bolts . . . with a series of strategically placed dowel or pipe pegs inserted in the 4x4's to support the parts or assemblies. Neoprene tubing is put on the dowels or pipes for parts protection. The majority of special racks constructed are now of this type.

Advantages are:

1. Cost comparison of the new vs. the old types of racks designed to store identical parts is on a ratio of 1 to 5. One rack recently installed cost $35.00, the rack it replaced cost $578 and occupied double the floor space.
2. Gross floor space required for the new racks is about one-half that formerly required. Net floor space has decreased about 25%, because the area of the racks is about the same as that of the parts.
3. Housekeeping has improved immensely. The old type racks occupied a floor space at least 1½ times the size of the parts being stored, involving a truss type construction on the floor to support the rack and the parts. Chips, coffee cups, rags, scrap parts, lunches, tool boxes, etc., were placed in or on these structures. Cleaning was accomplished by blowing with air or vacuuming, as it was impossible to sweep. And the superstructure of the racks became catch-alls for trash.

   Actual floor area required by the new racks is limited to the number of 4x4's used as vertical supports. Extraneous material cannot be put on these racks without being seen. The design allows sweeping under and around the racks.
4. Flow of production operations has improved

*TWO SPECIAL RACKS shown here replaced three standard 3x6 ft. stock racks. Note simplicity of design and ease of construction that provides exceptionally low cost yet efficient handling.*



*STORED WHERE THEY ARE NEEDED at the point of use, these parts were formerly stored on pallets in the stock room. By adding or removing dowels, racks are adaptable to storage of other parts if a change is required.*

considerably due to: a) cleaner work area, b) more available space, c) better control of parts and assemblies, d) retaining the work area as it is originally engineered. (When the racks are bolted to the floor, they cannot be arbitrarily moved.)

5. More parts may be stored in a given area or rack. The racks are used in the stockrooms, bringing further area savings.
6. The racks, by the inserting or removing of dowels, are readily adaptable to other storage functions. For instance, one rack that was no longer needed was adapted to a completely different part by adding dowels between each existing dowel and moving the vertical 4x4's bolted to the floor further apart. Total cost for conversion was less than $15.
7. Time required for physical handling of parts or assemblies is considerably less because of easier accessibility and because most parts can be put in the racks without interleaving with paper or other protective material. In the case of skin storage, where the 4x4's are placed horizontally on the floor and the pegs are placed vertically in them, material handling man hours have been reduced 75% over previous methods.
8. These racks, by virtue of their low cost and type of construction, do not require tagging and inventory by Property Control.
9. They are sturdy and rigid. One containing wing spars was hit by a fork lift truck without damage to parts or rack. None of the racks have toppled because of overbalancing. In fact, the construction is such that the pegs would break before the rack could become overbalanced.
10. Maintenance has been reduced. Most repairs, when required, are minor.
11. When the racks are no longer required they are removed and stacked neatly in a storage area or disposed of.
12. The increased efficiency and improved housekeeping have elevated enthusiasm of shop supervision and workers. The effect of a better work area has reduced man hours per product unit.

No disadvantages have been encountered to date. The designs and applications have been well received by production, manufacturing control and quality control personnel. Safety engineering and conservation people have enthusiastically supported the program.

The application of peg racks has not been restricted to parts and assemblies. Jig details, always difficult to store and control, have been put on peg racks. These require a different type of construction. A "wall," utilizing vertical 4x4's covered with 1 in. plywood, is secured to the floor by means of angle iron brackets. Dowels are then placed in the plywood where required.

A good example is that of a rack built for the main assembly jigs on the Boeing wing. It occupies approximately 24 sq. ft. of area. The racks it replaced occupied 174 sq. ft., did not provide adequate protection of details, and required constant supervision to maintain housekeeping standards. The same advantages of production parts racks apply here. Time required to locate needed details is only a small fraction of that formerly required. Improvement in housekeeping has been even more apparent.

Portability of the peg type rack is assured by making a frame placed on a standard Mercury trailer and then removing when necessary.

Nor-Air has approximately 150 of these racks in use. As rearrangements are made and new projects included, additional racks will be constructed. An estimate of the savings is difficult to make.

However, based on average areas and costs, there have been savings of at least 3000 sq. ft. in an area of 187,000 sq. ft. of manufacturing, stores, quality control and shop office area. Cost savings have been conservatively estimated at 10 times the cost of the racks.

Cost and area savings in the future will be even greater. Layouts for new products will include this type of rack wherever application is practical.

One interesting benefit to production departments is the closer control of inventories. The open nature of racks allows production and manufacturing control personnel to determine at a glance the remaining supply of parts. Manufacturing Control has stated that shortage reports from production are more accurate and prompt than before.

Industrial Engineering at Nor-Air is working on plans to standardize the racks as much as possible. Additional uses are being studied and applied at every opportunity.

# SPECIAL MACHINE speeds production

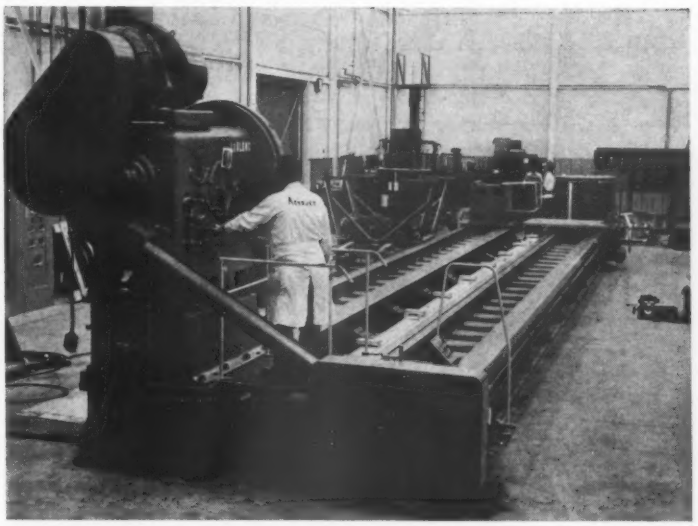
## Giant double bed lathe used in fabrication process

SPACE-AGE FABRICATION of large pressure vessels is being speeded by Aerojet-General Corp., Azusa, Calif., through use of a giant double-bed lathe made by the R. K. LeBlond Machine and Tool Co.

According to LeBlond, this machine is the first double bed lathe to be built in the United States, and perhaps in the world. Aerojet has been using it in its AeroWRAP fabrication process.

This involves fabrication of high-strength, lightweight cylindrical chambers by adhesive bonding of helically wrapped thin metal strips.

As installed at the Auzusa, Calif. plant, the lathe is 54 ft. 6 in. long and 120 in. wide, so large that there are only three railroad cars in the United States equipped to handle it. The 75-ton machine is operated by Aerojet's Structural Plastics Division.



*SPECIAL LATHE to handle job is over 54 ft. long and 120 in. wide.*

# CONVEYOR LINE packages metal items

## Extreme flexibility eliminates need for other lines

A PACKAGING CONVEYOR LINE — ensuring uniform protection of products and better customer service—has been installed at Kaiser Aluminum & Chemical Corp. Trentwood Works, near Spokane, Wash.

This installation conveys the packages through fixed stations for application of packaging compounds. Key feature of the system is an air-powered metal strapping stretcher unit which applies uniform tension greater than can be achieved by other means, and holds maximum tension until the strap is sealed.

The new strapping unit, controls and tools, was developed by Signode Steel Strapping Company, Chicago. Signode also assisted in designing the superstructure which supports the trapping system. Use of uniformly tensioned strapping eliminates excessive movement within the package and permits delivery of abrasion-free sheets. It also speeds the packaging operation, and reduces the amount of strap used.

Included in the conveyor line are rollers for quick application of wrapping materials, a crating station, a stenciling operation, and the strapping unit.

All of the aluminum flat sheet, the bulk of aluminum plate and other products of Trentwood such as roofing and siding, and blanks for fabrication, are handled on the packaging conveyor line. The line is very flexible, taking skids, pans and tables of products with equal facility. Heavy plate, which is handled on trucks, and aluminum coil are the only items not packaged on the conveyor line.

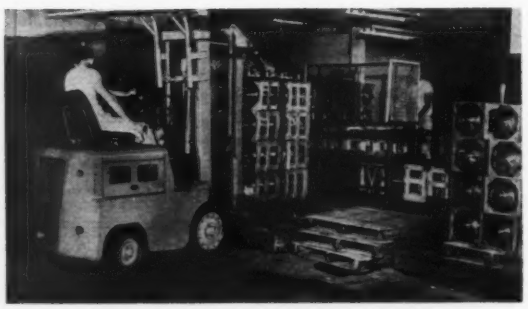
*EXIT END of packaging conveyor line lift truck is ready to remove skid of aluminum sheet.*

# BOTTLES PALLETIZED

## handling time cut

Lift truck with special handling arm allows bottler to load and unload bottles in large bulky palletized units.

*LIFT TRUCK TAKES 30-bottle pallet from incoming transport. Note special rigging to stabilize pallet from top and sides.*



*TRUCK ENTERS PLANT to unload the empties next to conveyor leading to washing, sterilizing cycles. Truck capacity is 3000 lb.*

*AFTER FILLING and capping, worker checks bottle for flaws and takes spot check samples to guard against water impurities.*

ARROWHEAD-PURITAS WATERS INC., bottler of spring, distilled, and fluorinated water, has reduced time and labor costs during storage, transport loading and unloading, and in-plant processing through introduction of Clark material handling techniques.

The Southern California firm operates three bottling plants, 13 distribution facilities, and a glass products division. They have 140,000 domestic customers, 30,000 commercial accounts. To service this business requires over 750,000 gallons of spring water a week and 1.5 million gallons of distilled water a month at the Los Angeles facility alone.

The bulk of this product winds up in the familiar five-gallon glass bottle.

Aside from constantly guarding against breakdowns in mechanical bottling and processing equipment there are two other critical phases of plant operation—material handling at both the inbound and outbound ends of the processing line.

In Los Angeles, for example, Arrowhead-Puritas trucks forward empty bottles to the plant in pre-palletized packages containing 24 or 30 five-gallon bottles each.

As soon as the truck is spotted the company's Clark-lifts move in to unload and transport empties to the inbound side of the processing line. Here bottles are removed from crates and are sent to the washing and sterilizing machines.

As bottles emerge from the washing operation, they are labelled, recrated and moved by conveyor in trains of 20 bottles each to the filling operation. From here bottles proceed via conveyor to an automatic capping device, then on to rigid inspection stations where bottles are checked for structural flaws and the water for impurities.

After quality control cycles are ended, filled bottles move along conveyor lines to the outbound stage of the processing line.

Individually crated bottles are transferred to the 24 and 30 bottle pallets to await shipment. They are loaded on trucks by 3000-lb. capacity Clark Carloaders equipped with special handling arm, adapted to fit the bottle pallets.

According to Arrowhead-Puritas vice president E. C. Bruce, Clark units have been subjected to cost studies and have proven more economical to operate per hour than the firm anticipated when the purchases were made.

# FALSE CEILING

## provides better cooling

Plenum cooling system increases efficiency at lower cost in an ice cream hardening room.

BY USE OF A PLENUM COOLING SYSTEM (in which the air propelled into a building is maintained at a higher pressure than the atmosphere) Carnation Co., Los Angeles, gained higher efficiency at lower cost in construction of an ice cream hardening room.

The building covers 20,560 sq. ft. and has a storage volume of 243,900 cu. ft.

In most hardening rooms, the ceilings are full of duct-work from air cooling units. Carnation engineers wanted to eliminate the eddy currents, uneven air distribution, lighting interference and lighting conduit troubles prevalent in their original five hardening rooms. These problems, they decided, could be solved best by the construction of a plenum system.

The hung ceiling, or plenum, they designed covers the entire room area and fits tightly against the walls. It extends 24 in. below the cork insulated ceiling. Into this 24-in. space, 10 Niagara No Frost units discharge refrigerated air.

In constructing the plenum, 2x3x6-in. treated wood blocks were installed in the center two-in. layer of ceiling cork. These were supported from above by ¼-in. carriage bolts attached to the ceiling joists. From each block a No. 8 wire hanger projects downward and is wired to the 3x2½x¼-in. aluminum tees of a grid forming the bottom supporting members of the plenum.

Wires are offset slightly from the carriage bolts in the wood blocks to avoid conducting cold to the outside, as would be the case in continuous metal work. Had this detail not been considered, freezing and thawing of condensation would have resulted, causing eventual damage to the insulation.

The hangers—and wood blocks—were spaced at 4x10-foot centers to conform to the size of exterior fir plywood panels which are laid into the aluminum tee frame. The faces of these 5/16-in. panels are surfaced with a tough, very smooth resin-fiber, known as a medium-density overlay.

The overlay is bonded by hot press at the plywood plant until it literally becomes part of the wood. It provides an ideal tooth for paint, and is as impervious to moisture and temperature as the exterior type glue which bonds the veneers.

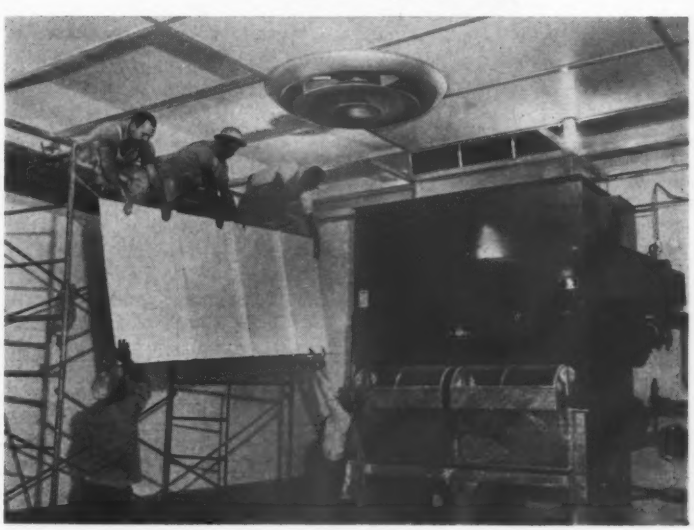
Wood stiffeners, 2x2 in., were glued to the upper face of the panels on two-ft. centers spanning the panel width of four feet. Two coats of mildew-resistant duPont white paint were applied to the upper faces, and three coats to the bottom faces before the panels were placed in the aluminum framing. They remain loose in the framing to expedite removal. Carnation engineers used plywood for its low condensation properties as well as for its rigidity and ease of installation.

Lighting conduits, serving vapor-proof fixtures, are attached to the bottom flanges of the tees and do not interfere with removal of the 4x10-ft. plywood panels.

The two door openings, at which relays load, are faced on the exterior with an eight-in. thickness of foam rubber built up in sheets and covered with canvas. In use, the doors of the relays are opened back against their sides; relays are then backed up against the foam rubber seals. The sliding doors on the inner face of the anteroom are then opened, and the relay is ready for loading with no loss of refrigeration during the loading period.

The entire building is particularly adapted to lift-truck operations because of its free-span construction. Insulated by two in. of Celotex, the roof is supported by tapered steel girders on 20-ft. centers, spanning 120 ft. with no intermediate columns. These girders have a six-ft. depth at mid-space and two-ft. depth at the ends, thus providing an accessible attic space.

*PLYWOOD PANELS, specially treated with resin-fiber overlay were used because of low condensation characteristics, rigidity and ease of installation.*



# HANDLING METHODS—how to improve them

Western panel of experts discusses in-plant material handling and gives answers on how to provide a workable materials handling program.

REPRESENTATIVES of the Western space and missile industry heard emphasis placed on work-in-process materials handling methods by a six-man panel covering new aspects, special problems, handling costs and effects on reliability during technical sessions at the recent SAE National Aeronautic Meeting in Los Angeles.

### New Developments

Panel Chairmen M. E. Griffey, Nortronics, and W. E. Kappler, North American Aviation, led Marc Worst, Lockheed Missiles & Space Division, J. C. King, Convair Astronautics, and C. R. Blomquist, North American Aviation, in the all-day panel session.

Leading off, W. E. Kappler briefly sketched new materials handling developments. He pointed to the steel industry using mammoth conveyor belts to move ore cross-country, airborne pods to haul airfreight, sidewalk conveyors to move people and material, even the transporting of fruits and vegetables from source to city food markets by piped water pressure.

According to Kappler, industry must inform employees of "what's new" in materials handling since they are and will be responsible for moving parts and components of present and future designs.

He said that employees should be briefed on make-up and structure of items they handle, their cost, and

*PANEL GROUP (left to right) C. R. Blomquist, North American Aviation; J. C. King, Convair Astronautics; Marc Worst, Lockheed Missiles & Space Division; W. E. Kappler, North American Aviation; and panel chairman, M. E. Griffey, Nortronics.*

how they should be moved to prevent breakage.

### Hard-to-Handle Items

Leading into a discussion of difficult to handle items, Marc Worst outlined a number of problem categories including explosives, radioactive items, magnesium, thorium, beryllium, teflon, metal clad plastics, and delicate instrumentation.

As an aid to processing difficult substances, Worst suggested conferences similar to those used at Lockheed where the plant procedures call for examination of every new "problem material" by the plant safety engineer, health officer, and the requesting department.

Processing of dangerous items should be covered by written instructions, Worst said, and added that they should be clearly identified by a visible description of the hazard affixed to the container. Data should include items like flash point for flammable material and compressibility for gasses under pressure.

As for explosives and other hazardous materials, considerable reference material has been issued for Western defense industries by the Air Force under Technical Order 11A-1-34, and for general industry under the State of California General Industry Safety Orders.

Worst suggested that paper work dealing with dangerous to handle items should be marked in red for emphasis. For guidance in handling radioactive materials, Worst cited the AEC regulation Title 10, again the California General Industrial Safety Orders, Article 53, the Air Material Command Manual No. 160-2, also the USAF Technical Order O-110A-1.

Other problem materials considered were magnesium-thorium alloys that present the dual hazard of fire and slight radioactivity and like Beryllium are conducive to respiratory ailments and dermatitis. Not only must these metals be marked dangerous, Worst warned, but scrap must be segregated to prevent worker injury.

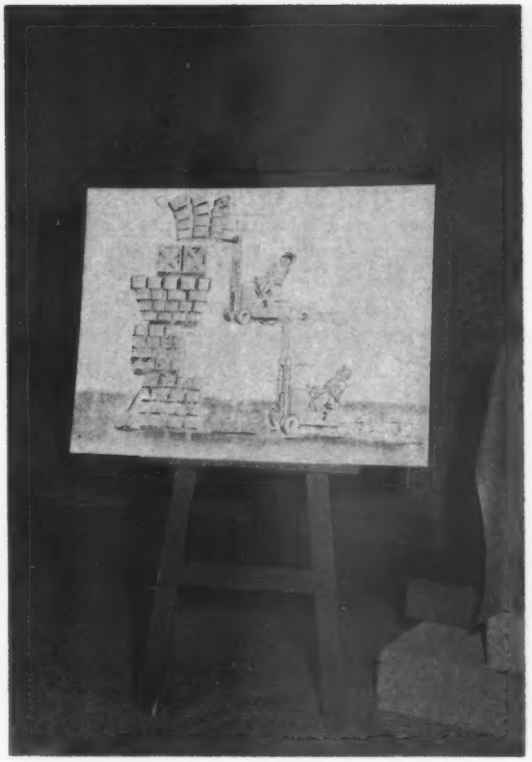
### Reducing Handling Costs

Turning to the expense of materials handling, panelist John C. King prefaced his remarks with the old saw about the best materials handling being no handling at all.

King outlined a four-point program including planning, operating, equipment, and cost analysis. Starting with an informed group of workers, a safe operation can be planned that would prevent some 22% of all industrial accidents which King attributes to handling operations.

He suggests avoidance of rehandling, moving units by gravity or practical mechanical means on a tight schedule that allows time for proper equipment maintenance. Using the proper standard equipment, chosen for flexibility and reasonable cost, plants can avoid expense and will be able to amortize equipment within reasonable lengths of time, he said.

Mechanization of the operation is King's keynote. He stressed that one-horse power today costs about $10.00 when supplied manually, $.75 by animal power, and is reduced to only $.04 through electricity.



*HUMOROUS CHART on "how not to do it", one of several used at the conference, which was part of SAE National Aeronautic Meeting in Los Angeles at the Ambassador Hotel.*

### Equipment Purchase

Stressing that today's technological advancements place ever increasing importance on reliability, Carl Blomquist, North American Aviation, urged that visual or non-visual damage to items through improper handling be avoided to prevent malfunctions that could cost lives.

Toughest problem faced by reliability engineers is finding and solving damage prior to malfunction, he said, and added that this can be accomplished with the help of the materials handling engineer equipped with complete knowledge of all phases of the handling process through which the item passes.

Blomquist then concentrated on purchase of proper MH equipment and in doing so stressed the value of taking advantage of thousands of hours of engineering design time and the high volume of production that cuts costs of suppliers' equipment over self-designed items.

If, after checking all possible commercial sources, Blomquist concluded, you find that no one had developed or produced an item for your particular requirement, then undertake your own design.

# SMALL DIESEL cuts hauling costs

Truck engine requires less fuel and maintenance.

MAKING ITS LOS ANGELES DEBUT recently is a new, small capacity Cummins diesel engine for use in commercial and industrial pickup-delivery operations.

*TRUCKS run by new small diesel engine.*

Called the Cummins Bantam Weight, it is claimed to be an ideal power house for operators of light and medium duty trucks hauling less than maximum gross loads.

Already in use at Asbury Transportation Co., it is powering a 3-ton International B182A tractor. It has also been installed in an International ¾-ton pickup model B-130.

According to recent cost evaluations the pint sized diesel will show savings of $500 yearly based on a 1250-mile-per-month operation.

The 70-hp. engine has a low idle, uses only one fourth as much fuel while waiting at the stoplight as its gasoline counterparts and less than one-half as much fuel during normal operation.

According to S. B. Cook, vice president of Cummins Service and Sales in Los Angeles, Bantam Weights function without a complex electrical system and will require no major overhauls for the first three years of routine service.

# ACCURATE JIGS solve production problem

Close tolerance jigs, special welding techniques for difficult assembly.

CLOSE TOLERANCES AND UNUSUAL CONFIGURATIONS were achieved by Blackwelder Mfg. Co., Rio Vista, Calif., through use of special jigs and welding techniques.

The firm is using these devices to produce 721 cart assemblies for United Air Lines. The cart assemblies are part of a pre-loaded baggage system for United's new DC-8 jets.

Made from 10 gage steel and welded to provide an automotive-type finish, the cart units have a contour similar to the belly configuration of the jet. The bottom curve has a 70.75-in. radius with a tolerance of plus or minus .030.

Fabrication of the units necessitated setting up a jig with tolerances of plus or minus .010 to hold the sections during welding. Certain portions of the unit had to be cut with proper distortion to maintain dimensions during direct welding and eliminate prior rolling.

Inert gas welding was used to minimize weld splatter and provide the desired surface. This eliminated the need for additional finishing and permitted a lower unit cost.

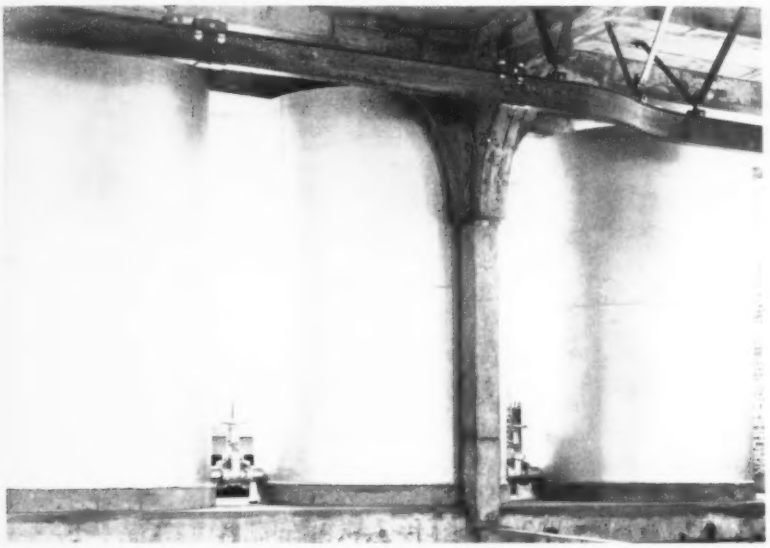
In addition, all bolt holes used to assemble the unit with running gear had to be at close tolerance to permit connection by semi-skilled personnel and possess full interchangeability.

*CAST ASSEMBLY, part of United's pre-loaded baggage system, required fabriation to close tolerances and special welding techniques for accuracy and desired surface finish.*

*. . . for more details, adv. opp. pg., circle No. 17 on Reader Service Postcard*→

# BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company VOL. 1 NO. 4



These welded Wrought Iron tanks, 9' dia. by 12' high, were installed in 1936 in the chlorine storage building at the Coney Island Sewage Disposal Plant, Brooklyn, N. Y. Steam heating coils suspended in the caustic tanks are also Wrought Iron. During all these years, not a nickel's worth of replacement was needed.

## 4-D Wrought Iron Curbs Corrosive Caustics, Lasts 2-4 Times Longer Than Other Metals

Two types of metal deterioration prevalent in caustic soda handling have been effectively curbed by 4-D Wrought Iron. Let's discuss the nature of this deterioration and consider an economical remedy.

### Caustic embrittlement stymied

This is an intergranular type of stress corrosion. Sounds the death knell for many metals. Cracks suddenly develop along the grain boundaries of the metal. There's little or no warning. They occur on exposure to heated caustic solutions, usually in areas where the metal has been stressed.

Crevices where caustic tends to concentrate are also particularly vulnerable to attack. Service reports indicate that 4-D Wrought Iron possesses excellent resistance to this type of corrosion.

### Normal corrosion stalemated too

This is a loss-of-metal type of deterioration. You run into this particularly when the metal's exposure to caustic soda is interrupted by periods of exposure to air, water or neutral solutions. Severity of corrosion depends on temperature and concentration. Over 250,000 glasslike iron silicate fibers per cross sectional square inch of 4-D Wrought Iron distributed throughout the highly refined base metal help halt and diffuse corrosive attack.

### Heated, concentrated caustics tougher on most ferrous metals

Heated and/or concentrated caustic solutions become increasingly corrosive to most ferrous metals. It takes a silicate-based metal like 4-D Wrought Iron to combat this type of corrosion effectively. That's why design and maintenance engineers are turning more and more to 4-D Wrought Iron pipe and plate for caustic soda heating tanks and heating piping used in caustic processes. Clip coupon for case history service reports.

## In Nuclear Equipment 4-D Does Not Distort Radiation Measurement

Manganese and carbon become excited or "stay alive" in a radioactive environment. 4-D Wrought Iron's *low* manganese and carbon content and *low* total metalloid content enable it to perform mechanical functions in nuclear processes without distorting radiation measurement. Check corresponding box in coupon for more information.

## Manganese Wrought Iron Resists Impact When Cold

A new specialty wrought iron has been developed for use as an economical, impact resistant metal for low temperature design.

You can use Mn Wrought Iron in the petroleum, chemical and refrigeration industries and others in which brittle failure is giving trouble. It's available in pipe, plate, other forms. Clip coupon for details.

## Lower Tubing Costs

Cold drawn 4-D Wrought Iron heat exchanger and condenser tubing is virtually unaffected by ammonia, carbon dioxide and Freon. 4-D tubing lasts longer than steel in salt water, heat transfer brines, and industrial cooling waters. In most tubing applications, 4-D costs less per foot per year of service than other tubing materials. Check coupon for proof.

A. M. Byers Company
Product Development Department
Clark Building, Pittsburgh 22, Pennsylvania

Please send data on items checked:

- ☐ Caustic Soda Handling
- ☐ Nuclear Process Equipment
- ☐ Mn Wrought Iron
- ☐ Condenser and Heat Exchanger Tubing
- ☐ PVC Pipe for Machine Tool Equipment
- ☐ Calorized Wrought Iron
- ☐ Laboratory Test Results
- ☐ Block Rack Construction

Name ..... Title .....

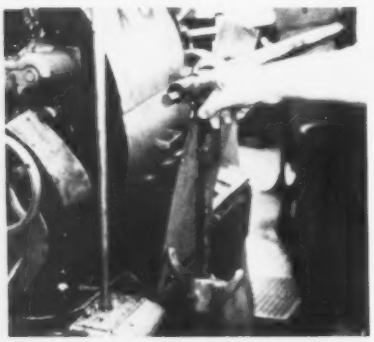
Company .....

Address .....

# BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company





Hex bar fits snugly in feed rack after liner is in place, so that no adhesive bonding agents are necessary.

## New Design Idea* Muffles Noisy Machine Clatter

A new idea for muffling the clatter of machine tool equipment while in operation has been developed by A. M. Byers Company.

Recently a patent application* was made for the new idea which involves lining the bar guide or feed rack on automatic screw machines, turret lathes, etc. with PVC Pipe.

Noise is virtually eliminated and nicking or scratching of bar material is impossible. Some manufacturers have found that the metal feed rack can be replaced with PVC entirely on certain equipment such as engine lathes.

The original test installation of PVC Pipe in this application has been going strong for 10 months with no sign of trouble. And the cost of lining or replacing the feed rack with PVC Pipe is phenomenally low. It's less than $5.00 on single feed machines.

For more details on this one, check the coupon and mail to us.

*Patent pending, A. M. Byers Company

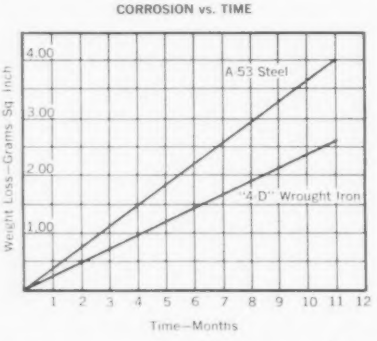
## Soot-Blowers Use 4-D To Combat Oxidation

Blowing soot with steam or air tests the temper of the toughest metals. Oxidation is a constant threat, especially to fire tubes. Some metals flunk such hot-again, cool-again tests of endurance. But not 4-D Wrought Iron. 4-D can be furnished *calorized* to resist corrosion at high temperatures (1000—1600°F) prevalent in this service. Fill out coupon for more details.

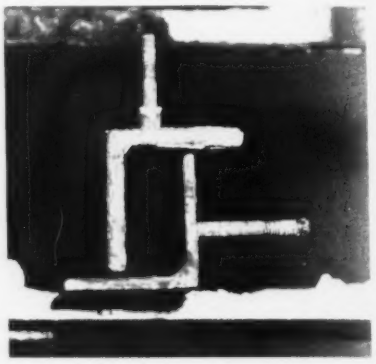
## Lower Corrosion Rate For 4-D Wrought Iron

Data for 4-D Wrought Iron and steel plot as virtually straight lines, with 4-D Wrought Iron having a lower slope or rate of attack. Curves will flatten with time.

These data indicate that the 4-D Wrought Iron curve will continue to flatten at a lower rate than the steel curve. Other 4-D Wrought Iron test results are available on request. Please refer to coupon.




Here is a comparative laboratory analysis of corrosion losses in aerated salt water. Tests were conducted by A. M. Byers Company metallurgists.



This unretouched photo shows a comparison of 4-D Wrought Iron and steel after in-service testing at Mercier Brick Company, Dearborn, Michigan. That's 4-D Wrought Iron on top. Steel angle rests directly underneath. Both of these angles were ¼-inch thick when placed in service, side by side on the same rack.

## Concrete Block Racks: Which Metal Lasts Longer?

If you guessed 4-D Wrought Iron over steel, you're 100% correct. After 11 months—101 cycles—the 4-D Wrought Iron angle has retained its original thickness. But the steel angle has already lost more than half of its original thickness due to extreme flaking and disintegration from corrosion. 4-D Wrought Iron's resistance to corrosive elements in block production processes is characterized by a hard, impregnable surface shield which cannot be flaked. Even with blows from a hammer. You be the judge. Which metal would *you* use in concrete block rack service? Send coupon for new booklet, "Modern Concrete Block Rack Construction."

For additional information on 4-D Wrought Iron, Contact Byers Division Offices in the cities listed below.

The maintenance and operating items appearing in BYERS GUIDE #4 were prepared by the Engineering Service Department of

**A. M. BYERS COMPANY**

Pittsburgh 22, Pennsylvania

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA
PITTSBURGH • ST. LOUIS • SAN FRANCISCO • WASHINGTON, D. C.

4-D Wrought Iron is immediately available and may be obtained through established distributors of Wrought Iron Pipe. Plate, bar, and other flat rolled products may be ordered direct.

**Corrosion costs you more than Wrought Iron**

Printed in U.S.A.

A SPECIAL western industry REPORT

# HOW TO CONTROL in-plant pollutants

Clean air inside plants has become a vital production tool in this Space Age. Here is what leading Western industries are doing to control in-plant pollutants . . .

CLEAN AIR inside Western plants is more than a nicety in this Space Age. It's a necessity. Air free of contaminants is a production tool in many industries—especially those engaged in defense and electronics work. Often, production and testing must be done in "clean rooms" where even the most minute particle of dust or moisture could wreck performance.

And in many other plants, clean air is needed for electrical control rooms, electronic data processing equipment, and for process air to blowers and diffuser plates.

Don't overlook the human element. Dust, grit, smoke and other contaminants can be costly in terms of reduced production . . . lowered quality . . . more rejects . . . higher maintenance costs . . more accidents and employee turnover.

In trying to shut the door on in-plant pollutants, Western industry has turned to manufacturers for devices that will take contaminated air and clean it efficiently. The result has been improved plant operation and increased profits.

WESTERN INDUSTRY editors have spent weeks in the field, visiting many plants and jotting down facts on the control of in-plant pollutants. Here is what we found:

## Eliminating fumes, odors from plating . . .

Anachrome Corp., of South Gate, Calif., has developed an air purification system that not only eliminates fumes from chrome plating tanks, but also the strong odors that prevail in most chrome plating operations.

Fumes are sucked out through ducting located 3 in. above the tank solution. Ducts have 25 sq. in. of opening per linear ft.

Ducting leads the fumes through a continuous water fall apparatus which circulates 1000 gal. of water through an air scrubbing system. Water is constantly replaced upon contamination.

Water removes all chrome and particulate matter from the fumes as the double-water wash blower system sends over 30,000 cu. ft. per min. of purified air to the in-plant atmosphere. The system was built by the Circle Industrial Manufacturing Corp., South Gate, Calif.

## Meeting strict air pollution codes . . .

Meeting the requirements formed by stringent air pollution codes is no easy job when dealing with troublesome and variable foundry fumes.

At Lincoln Foundry Corp., Los Angeles, discharge of solids and hot gases from a 78-in. cupola has been

controlled through use of a Wheelabrator Corp. Dustube Collector System. This provides complete in-plant fume removal by means of an automatic device that discharges purified and cooled gases into plant atmosphere and surrounding areas.

Referring to the diagram at the bottom of the page: Hot, dust and particle-laden cupola gas enters ducting, lower left, passes baffle mechanism (A) that restricts infiltrating air, rises up the cupola stack (B) passes the stack cap (C) and through the stub pipe (D) into the primary quencher or cooler unit (E).

Cupola gases are conditioned by these cooler and secondary cooler (G) through use of pressurized water that cools through spray nozzles. After leaving the secondary cooler, at much lower temperatures, gases move through an exhauster (H) and into the bag house (J). This unit is of tubular type and has five compartments for housing dust and particulate matter.

Item (L) is a thermostatic control which actuates the secondary cooling unit. Item (K) is a bypass outlet to the atmosphere.

The bag house is designed so that one compartment at a time may be automatically shut down and the bags shaken to restore filtering potential while remaining compartments continue to filter solids from the total gas volume entering the bag house.

The operation of the bag house is controlled automatically by a program timer that actuates damper valves, starts and stops shaker mechanisms. Overall efficiency of this equipment under normal operating conditions is rated in excess of 99%.

## Expelling acid fumes, oil mist . . .

Acid fumes present a personnel hazard and oil mist, a plant housekeeping problem. Also, these contaminants are hard to expel.

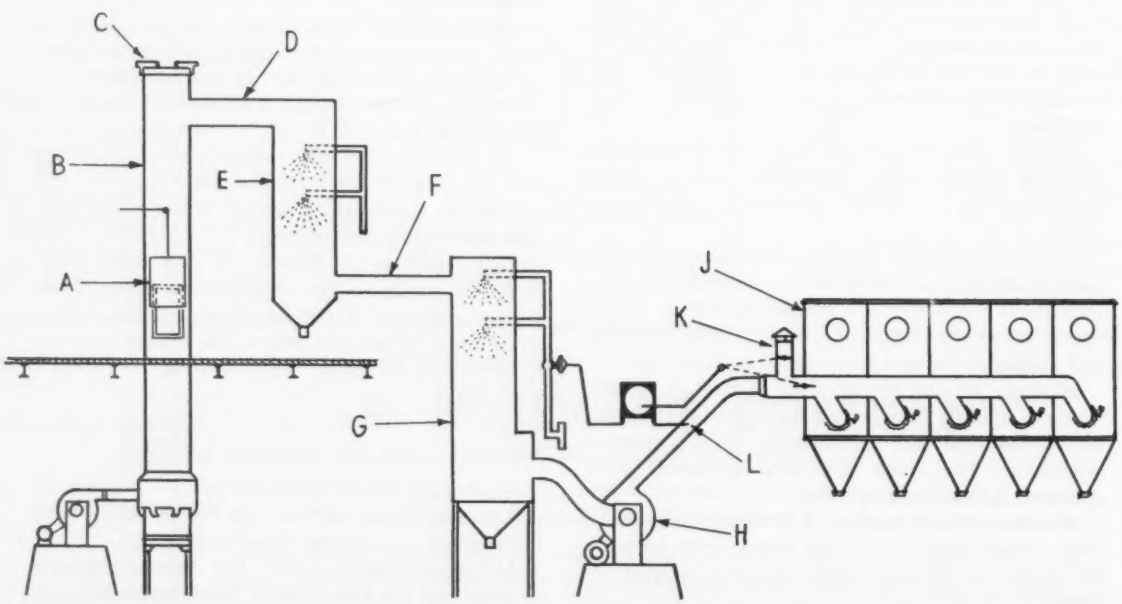
But plant engineers at Marchant Division of Smith-Corona Marchant Inc. (Oakland, Calif.) have devised ingenious systems to get rid of the acid fumes and oil mist.

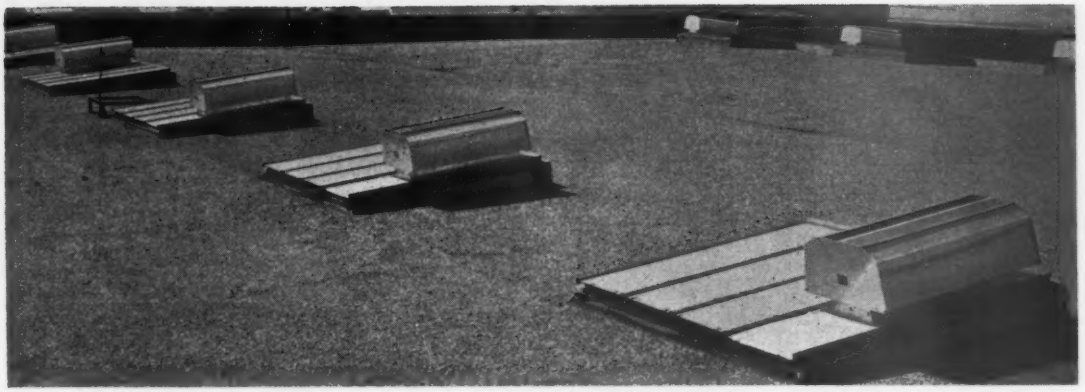
Acid fumes occur in the plating room. In this room, the automatic plater has large vats of 17% solution muriatic acid. Just above the surface of each vat is Heil Process Equipment Corp. acid-proof hood and ducting, made of polyester fiberglass reinforced plastic.

This ducting is connected to a fan and an Arco scrubber on the roof. The fan draws the fumes up through the ducting into the scrubber. The scrubber contains saddle packing which is kept constantly wet. The action of the acid-laden air passing through the wet packing is enough to remove all harmful acids (acids adhere to water particles). The neutral fumes are then expelled to the atmosphere. One other point: the rotor of the fan (a Westinghouse-Sturtevant Div. fan) is coated with Plasite, an acid-resistant coating that resists any harmful effects of the fumes.

Another type of system is used on the cyanide pots in heat treating. Ducting picks up the fumes at the sources and carries it to an American Air Filter Co. Roto-Clone unit. This device has a rotor which is kept wet by a water spray. When the fumes hit the rotor, the sodium cyanide particles adhere to the water and the clean air is discharged to the atmosphere.

*TROUBLESOME FOUNDRY FUMES are safely and efficiently expelled by this collector system. The unit meets strict air pollution codes. Parts designated by letters are explained in story above.*





*ROOF EXHAUST VENTILATORS installed on skylights take the place of glass panels. Large throat and side openings in ventilators permit a large volume of air to be expelled under all conditions.*

An unusual type of in-plant pollutant device is the oil mist collector. The hood and duct work of this system are attached to the multiple spindle automatic screw machines. A fan on the roof provides suction to pick up the oil mist generated in the cutting operations and carries it to an electric precipitator. This unit has a series of wires that are charged to attract the particles of oil. This causes them to cling to the wires and to drop down into a collecting tank.

In this way, not only is some oil reclaimed, but a tough plant housekeeping problem is solved.

## Adjustable blade, vaneaxial fans . . .

Some Western plants—like the Van Nuys, Calif., Chevrolet Plant—are using adjustable blade, vaneaxial fans to dispel fumes throughout their operations.

These fans have stationary straightener-vanes located immediately behind the rotor. This creates an axial airflow from the blower and partially recovers the rotative energy imparted to the air by the rotor. This rotative-pressure recovery adds to the efficiency of the fan.

Axial fan discharge is made possible by equal pressure distribution at all points across the fan outlet. The unequalized outlet pressure of other fans creates non-axial, turbulent airflow, which is wasteful of power.

The streamlined airflow minimizes the system noise-level and makes sound insulation a simple and inexpensive operation.

Fans of this type are manufactured by the Joy Manufacturing Co., Pittsburgh, Pa.

## Curbing solder flux smoke, fumes . . .

Mole-Richardson, Hollywood, Calif., manufacturers and distributors of specialized lighting equipment, solved a smoke and fume problem caused by soldering flux operations by installing a series of roof exhaust ventilators.

Problem area was a building where cables, reflectors and scrims (lamp diffusers) are made. Smoke and fumes on the main floor of the building would rise and spread in the mezzanine floor, causing employee discomfort and interfering with production.

The roof had skylights but no exhaust ventilation provision. Heat from the sun and residual heat left by daily operations created a thermal lid over the smoke and confined it in work areas.

Colt Ventilation of America engineers in Los Angeles solved the problem. They fixed the amount of heat gain in the 14,000-sq. ft. factory and warehouse building at 500,000 BTU/hr., of which 1/3 was coming from skylights comprising 1/30 of roof area.

Ten Colt Hi-Duty roof exhaust ventilators were installed, one to a skylight. These units are in modular sizes that fit easily in between glazing bars and take the place of glass panels in the skylight. Large throat openings in the ventilators and the airfoil sides permit a large volume of air to be exhausted over a wide range of internal heat and external wind conditions.

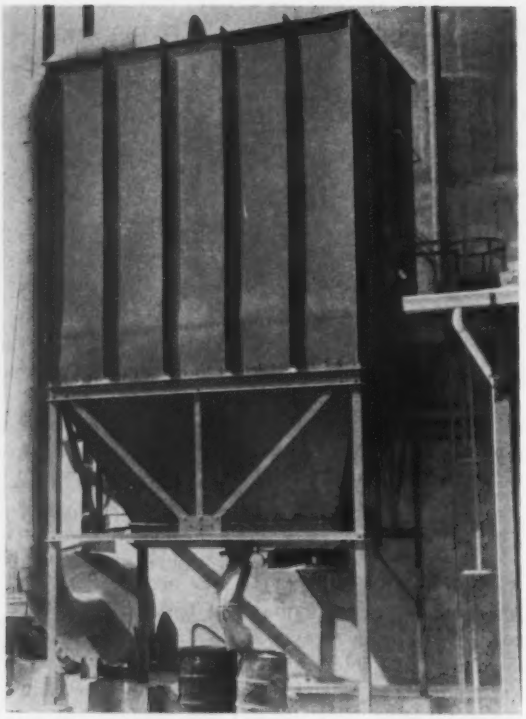
## Dust control for novel storage, batch mixing . . .

Providing complete dust control for a novel materials storage and batch mixing plant presents unusual problems.

The plant—the Anchor Hocking glass plant in San Leandro, Calif.—is different in that storage of materials is in what appears to be one large (38-ft. dia.) concrete silo. However, this building actually has 13 separate storage bins, varying in size according to the material to be stored. Eleven raw material bins are arranged in a circle around two large bins in the center.

The bins are fed by a series of elevators and conveyors.

Dust control is provided at the raw material unloader . . . raw material elevator . . . each of the 13 storage bins . . . turret of the primary weigh hopper . . . turret of the secondary weigh hopper . . . batch conveyor . . . surge hopper . . . mixer discharge hood . . . cullet conveyor . . . cullet elevator.



*COMPLETE DUST CONTROL for a novel materials storage and batch mixing plant is provided by this system described in the article.*

Since only one of the 11 raw material bins is fed at any one time, the dust control system was so designed that exhaust ventilation is applied at only the proper bin. This is accomplished by a series of electrically controlled dampers. Another dust problem was the ventilation of the weigh hoppers, since the pulling of a vacuum on these hoppers would upset the accuracy of the scales and affect the quality of the product.

The system that solved these problems was designed, fabricated and installed by the Rees Blow Pipe Co. (Berkeley, Calif.) It included the Rees series 600 dust arrestor equipped with cotton sateen filter tubes, a constantly discharging hopper valve, and an electric motor driven shaker device. The whole system is maintained under suction by a Rees high efficiency exhauster.

## Removing particles from finishing operations . . .

A high speed finish grinding operation on automobile bumper guard assemblies can introduce abrasive particles, metallic dust and chips to air supplies in work areas.

Since this grinding line is operated at high cyclic speed, employees must work at peak efficiency in areas with clean air and high visibility. To accomplish this, engineers from Flexible Tubing Co., Anaheim, Calif., were called into the plant to install Spiratube R-type ducting to exhaust all particulate matter into collection apparatus.

Spiratube-R is designed for abrasion resistance and is built in helical coil form for complete flexibility and ease of installation. Base fabric is wound over carbon spring steel and built up with ply upon ply of natural rubber, neoprene or other polymer depending upon application involved.

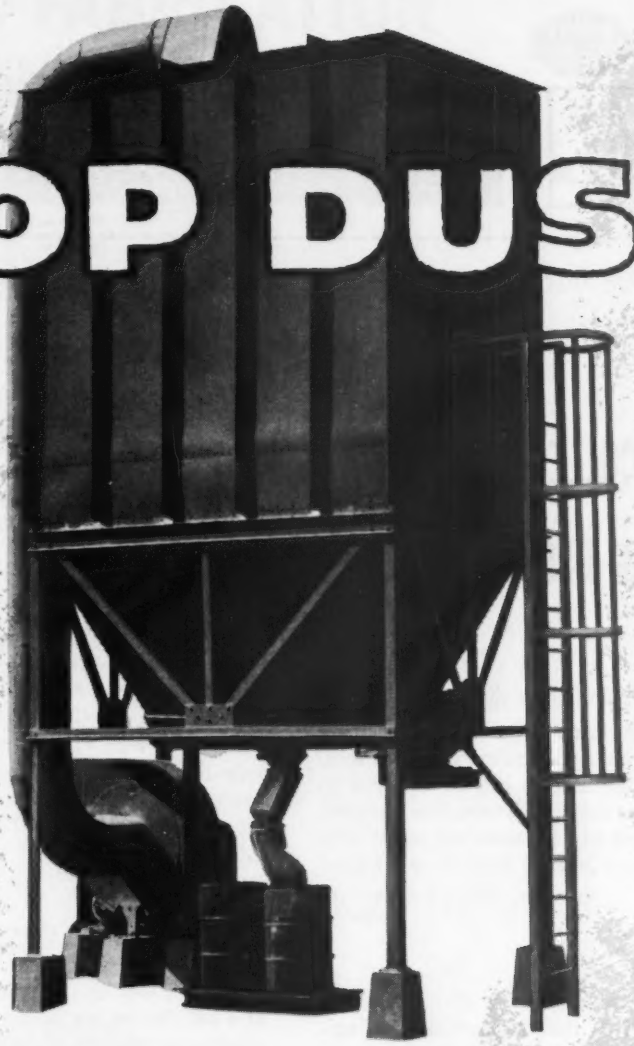
Spiratube-R wall thicknesses range from 0.36-in. to .186-in.

## Selecting your own system . . .

These are what just a few Western plants are using to control in-plant pollutants. You'll find more control devices mentioned in the special manual section following this report. For a supplier of these units, please refer to the Buyer's Directory following the manual section.

*ABRASIVE PARTICLES, dust and chips are exhausted by this flexible spiral tubing placed over grinding machines at this automobile plant. Note how the hood of the tubing covers the grinding wheel to effectively pick up foreign particles as they are spun off.*

# STOP DUST!



## REES CLOTH TUBE DUST ARRESTORS

# STOPS DUST...

### COLLECTS WASTE OR PROVIDES EFFICIENT MATERIAL RECOVERY

**DUST** collection problems are individual. REES CLOTH TUBE DUST ARRESTORS are designed to meet the precise requirements of a particular DUST or material collection problem.

**STOP DUST** by calling on REES' 52 years of experience in meeting DUST control, industrial ventilation, pneumatic conveying and sheet metal requirements.

**MOVE DUST-LADEN AIR with REES STEEL PLATE EXHAUSTERS.** Designed and developed by specialists in handling DUST, smoke and materials, these exhausters are made to provide high efficiency and long life under critical DUST and fume conditions.

**Bring your DUST problems to REES**

## REES BLOW PIPE MANUFACTURING COMPANY, INC.

REPRESENTATIVES IN PRINCIPAL WESTERN CITIES

SALES OFFICES AND PLANTS: 2929 FIFTH STREET, BERKELEY 10, CALIFORNIA • 5714 MORGAN AVENUE, LOS ANGELES 11, CALIFORNIA

*. . . for more details, circle No. 18 on Reader Service Postcard*

# SPECIAL MANUALS

FOR YOUR FREE COPY, CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, p. 75

## DUST COLLECTORS

## FANS & BLOWERS

### Structural plastics in air ventilating ducts

Acids and other harmful elements can wreck an ordinary ventilating system. But with the plastic ducting, hoods, fans, etc. described in these bulletins, you can be equipped to install a corrosion-proof air cleaning system. The chemical resistance charts will answer any questions you might have on the effectiveness of these plastics. *Heil Process Equipment Corp.*

. . . FOR YOUR COPY, CIRCLE NO. 150

### Cloth tube dust arrestors

Both intermittent duty and continuous duty cloth tube dust arrestors are detailed in this six-page folder. Engineering drawings reveal the details of these units, and specification tables fill you in on other points. All parts and their operation are fully described. Many sizes and capacities are available to fit any installation. *Rees Blow Pipe Co.*

. . . FOR YOUR COPY, CIRCLE NO. 151

### Fans, blowers, louvers, ventilators

There is lots of technical information in this 20-page two color booklet on all types of fans and blowers, automatic louvers, penthouses, and roof ventilators. It's profusely illustrated and full of charts and engineering data. A must for your file. *Peerless Electric Div., H. K. Porter Co., Inc.*

. . . FOR YOUR COPY, CIRCLE NO. 152

### Adjustable blade, vaneaxial fans for industrial use

The fans described in this 16-page handbook and models of economy and performance. With stationary straightener-vanes and adjustable blades, they can be adapted to any industrial air pollution situation. The handbook shows you how these fans work, then presents a series of pictures showing actual installations. Specification tables in the back round out the picture. *Joy Manufacturing Co.*

. . . FOR YOUR COPY, CIRCLE NO. 153

### Typical users of Dustube collectors

Only one page of this 24-pager is needed to explain how this fume and dust collector operates. Then the booklet launches into a series of photos depicting typical users. Each installation is shown, with picture lines explaining what the setup accomplishes. Then follows a list of firms using similar installations. *Wheelabrator Corp.*

. . . FOR YOUR COPY, CIRCLE NO. 154

### Flexible ducting for fume, dust removal

Flexible ducting can be brought to the source of fumes and dust, so their removal can be efficient and safe. Two bulletins describe lightweight flexible ducting that can be used for a wide variety of applications. The Thermaflex type has been designed exclusively for low and high-pressure air conditioning systems . . . and the Flexflyte for most other uses. *Flexible Tubing Corp.*

. . . FOR YOUR COPY, CIRCLE NO. 155

### Self cleaning, cloth screen dust collector

If you want continuous, efficient control of industrial dust, then you should read this 12-page booklet. It tells of a self cleaner, cloth screen dust collector that has many advantages. Sections tell how the unit operates, with photos and diagrams filling out the details. Actual installation photos on page 10 and 11 show you the many jobs this unit is now doing. *Pangborn Corporation.*

. . . FOR YOUR COPY, CIRCLE NO. 156

### Air handling-conditioning equipment with "Q" factor

Hundreds of fans and blowers of all kinds are detailed in this 16 pager. All have the "Q" factor—described as "built-in quality which provides trouble-free satisfaction and long life." Photos, cutaway diagrams, and specification tables help tell the story. *Buffalo Forge Co.*

. . . FOR YOUR COPY, CIRCLE NO. 157

### Putting air to work for you

Air handling, cleaning and conditioning units of all sizes are pictured and described in this folder. The units can be used throughout your plant to give you clean air when you need it. A more detailed catalog is available on each air apparatus presented in this folder. Thus, this folder is your guide to a complete library on air equipment. *Westinghouse Electric Corp., Sturtevant Div.*

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# CREATIVE FABRICATION at BLACKWELDER MEETS THE JET AGE CHALLENGE...

**PRODUCTION ORDER**

UNITED AIR LINES

To: Blackwelder Manufacturing Company
Rio Vista, California

Attn: Mr. George Marshal*

Produce 721 cart assemblies (per attached drawings) for United Air Lines' DC-8 Jet Mainliner pre-loaded baggage system. Exact duplication and full interchangeability of assemblies is essential. Cart units will be mounted on running gear at individual stations throughout United's nation-wide system.

To insure "drop in" of assemblies to running gear, holes for bolting and pylons must be held to +.010 inch tolerance over 85.750 in. on arched 10-gauge non-supported weldment. Contoured bottom of the assembly (similar to the belly configuration of our DC-8) has 70.75 inch radius with +.030 inch tolerance.

Weldments, 772 inches per shell, must be of automotive type finish to eliminate additional finishing and subsequent effect on unit cost. (We at United intend to give customers' baggage Rolls Royce treatment.)

Bond inside rubber pads to steel to insure longevity under all extreme climatic conditions.

721
772
1442
5047
5047

½ million plus inches of welding

Cut shell sides with proper distortion to allow direct welding without prior welding

Hold pylon pads square .010 inches tol. use precision jigging

Aircomatic inert-gas AF MIL-5021A

*George Marshal is Plant Superintendent

*Recent contract manufacturing production runs included:*

GROUND SUPPORT EQUIPMENT
TRAILERS
MISSILE COMPONENTS
STEEL TANKS, FREIGHT CAR
FREIGHT CAR BULKHEAD REINFORCEMENTS
PLUS—BLACKWELDER'S PROPRIETARY LINE OF AGRICULTURAL EQUIPMENT

*For high unit production at low cost write to:*

**BLACKWELDER**
*manufacturing company*
RIO VISTA • CALIFORNIA

*. . . for more details, circle No. 19 on Reader Service Postcard*

### Centrifugal roof ventilators

You will want a copy of this 12-page brochure on both direct drive and belt drive centrifugal roof ventilators. It's loaded with technical details, charts on performance and other data. Brochure is perforated for filing in three ring notebook for easy addition to your quick reference file. *Peerless Electric Div., H. K. Porter Co., Inc.*

. . . FOR YOUR COPY, CIRCLE NO. 159

### Lip type fume exhausters

The fume exhausters described in this folder can provide an inexpensive yet highly efficient way to get rid of in-plant fumes. Several models are available. Charts show the capacities of each, and dimension tables and engineering drawings fill you in on the rest of the facts. *Master Fan Corp.*

. . . FOR YOUR COPY, CIRCLE NO. 160

### Smoke density indicator

You can watch that smoke with this photoelectric unit described in this four-pager. And you can keep a record of the smoke. Units are pictured and completely described. Typical applications are shown in diagrams. On the back of the folder you can find out how you can reduce smoke with this unit. *General Electric Co.*

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### General file on natural ventilation

This handsome file folder supplies you with all the facts you'll need on a system of natural ventilation. Pictures, diagrams, charts make the information readily available and easy to understand. Actual installation shows you typical uses. A thumb nail index leads you to the sections you want. *Colt Ventilation of America, Inc.*

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### Belt drive blowers

This 36-page color pamphlet gives complete technical details and information on belt drive blowers, non-overloading Class 1. Subjects covered are: construction details, performance data, dimensions, rectangular equivalents of round ducts, friction of air in straight ducts, ventilation data for hoods and slotted intakes, and recommended and maximum duct velocities. Pamphlet is full of helpful engineering charts and graphs. Very useful for plant engineers. *Peerless Electric Div., H. K. Porter Co., Inc.*

. . . FOR YOUR COPY, CIRCLE NO. 163

### Air purification with activated carbon

The same substance used in gas masks—activated carbon—can be used for air purification. In this 12-page handbook, you can learn about activated carbon cells and canisters that can play vital roles in your air purification system. All application and specification data is included. *Connor Engineering Corp.*

. . . FOR YOUR COPY, CIRCLE NO. 164

### Cycloidal blowers for vacuum service

Engineering and application data on these blowers for vacuum service is contained in this 15 page handbook. A pictorial fold-out reveals the unique features of these units. Charts and tables supply other data you'll want to know. *Roots-Connersville Blower.*

. . . FOR YOUR COPY, CIRCLE NO. 165

### Industrial pans and blowers

This pamphlet discusses and describes the various types of fans and blowers giving the application to which each type is best suited. In addition to a picture being shown for each type, front and side view line drawings and dimensions and performance data charts are given. It makes a very handy engineering reference for industrial fans and blowers. *Peerless Electric Div., H. K. Porter Co., Inc.*

. . . FOR YOUR COPY, CIRCLE NO. 166

## POWER

### Engineering data on hydroilic pump/motor

This eight-pager sets down engineering specs on a hydroilic pump/motor (2000 psi., single-stage, vane type, dual purpose) that has dual purpose versatility. Used as a pump the unit provides high delivery in a small package. As a motor it offers high stalled torque ratings of 13 to 257 lb.-in. per 100 psi. *Denison Engineering Division, American Brake Shoe Co.*

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### 24 pages on stationary air compressors

This booklet details information on a V-vertical compressor built for continuous, heavy duty service for pressures to 125 psi. with piston displacements from 468 to 974 cfm. The booklet contains specifications, diagrams, cross-section drawings, installation photographs and other pertinent information. *Joy Manufacturing Co.*

. . . FOR YOUR COPY, CIRCLE NO. 168

### Portable air compressors from small to large

There's a size and type for every air requirement in this brochure. Each air compressor is pictured, described as to application, and standard equipment. On the back are complete specification tables to round out the information. *Schramm, Inc.*

. . . FOR YOUR COPY, CIRCLE NO. 169

### Two stage—air cooled air compressors

Every industrial air application is covered by these air compressors that range from 25 to 40 hp. Material handling . . . tools . . . spraying . . . power presses . . . you name it and these units can do the job. All features are described and complete specifications listed. *Curtis Manufacturing Co.*

. . . FOR YOUR COPY, CIRCLE NO. 170

# AIRCO'S NEW HI-LO CONTROL FOR MACHINE TORCHES

## *gives you substantial gas savings*

### IT SAVES GAS BECAUSE YOU CAN GET

- *proper preheat flow for starting a cut*
- *minimum flow for balance of cut*

The Duplex HI-LO Control enables the flame cutting machine operator to vary preheat oxygen and fuel gas during the cutting operation . . . from a heavy preheat at the start to a lighter preheat once the cut is underway. Less oxygen and fuel gas are consumed.

Additional bonuses are faster starts and quality cuts free from melted-down edges and warpage.

The Duplex HI-LO is simple to operate, and moderate in cost. A Single HI-LO is also available for adjusting preheat oxygen only when low pressure fuel gas is used with injector-type torches. Both can be used with all Airco flame cutting machines.

*For more information, call your nearest Airco district office or authorized Airco dealer. They are listed in the Yellow Pages under "Welding Equipment and Supplies."*

AIRCO®

**AIR REDUCTION PACIFIC COMPANY**

SAN FRANCISCO • LOS ANGELES • PORTLAND • SEATTLE
Bakersfield • Burbank • Emeryville • Fresno • Inglewood
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*Western Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories*

*. . . for more details, circle No. 20 on Reader Service Postcard*

**Two stage—"Ro-Flo" rotary compressors**

The advantages of these single and two-stage "Ro-Flo" design rotary compressors for shop air gas handling, drilling and many other applications are told in a four-page bulletin. Dimensions and ratings for the sliding van type units are also included. *Allis-Chalmers Mfg. Co.*

. . . FOR YOUR COPY, CIRCLE NO. 171

**Spring loaded, over center, multiple clutches**

Clutches to move industrial equipment and machinery are featured in this folder. All units are pictured, fully described, with complete specifications listed. Especially useful are the multiple disc clutches which are used in industrial machinery and machine tools as main clutch drives, as auxiliary clutches controlling individual units, and in power take-off mechanisms. *Rockford Clutch Div., Borg-Warner Co.*

. . . FOR YOUR COPY, CIRCLE NO. 172

**Automatic centrifugal clutch and clutch-coupling**

Design, performance characteristics, selection and application of these clutches are thoroughly spelled out in this 16-pager. The manual is organized so you can quickly grasp those details pertaining to your operation. Especially helpful is the data on sheave assemblies and installation and removal sections in the back. An application data form is also provided to help you select your clutch. *Formsprag Co.*

. . . FOR YOUR COPY, CIRCLE NO. 173

**Two-stage, water-cooled air compressors**

Photos take you through this 12-pager. The large illustrations (a half page in depth) let you see each model. The center spread breaks down some of the details with cutaway photos. Then installation photos show you how these compressors can do the job. Engineering data is on the back. *Gardner-Denver Co.*

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**New drive to handle difficult drive problems**

A new and better way to handle many difficult drive problems is detailed in this 24-page booklet. It describes a dry fluid drive which permits soft starts to reduce current draw, protect motors and driven machines. The starting torque is tailored to individual needs by adjusting flow charge of minute heat-treated steel shot. The booklet is complete with engineering drawings, installation photos, etc. *Dodge Manufacturing Corp.*

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**Steam driven air compressors**

Ratings, advantages and recommended uses of steam driven air compressors are included in this 12-page booklet. Operational data for single and two-stage compressors is included. Large engineering drawings explain how the units can work for you. *Westinghouse Air Brake Co., Industrial Products Division.*

. . . FOR YOUR COPY, CIRCLE NO. 176

**Complete round-up on air compressors**

This 20-page package wraps up all the vital data on air compressors. It discusses features . . . selecting a compressor . . . electric and gas air compressor outfits . . . general air compressors . . . components and accessories. Tables give the most detailed facts. Price list and ordering information is included. *The DeVilbiss Co.*

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# SPEED REDUCERS for efficient operation

## Cooling tower fans use reducers for exact speeds

FANS USED IN COOLING TOWERS are subject to constant attack from moisture laden air, which can wreak havoc on motors driving the fans unless special precautions are taken.

The Fluor Corp. in Los Angeles has found that by using speed reducers manufactured by Western Gear Corp., and driven by electric motors outside the fan stack, absolute cooling tower efficiency is assured for very extensive periods of operating time.

Speed reducers in cooling towers are needed to supply speeds from 90 to 120 rpm, from motors with normal rpm's of 1200 or 1800.

The motors (which vary in size from 5 to 75 hp. in seven different sizes) are joined to the speed reducer with a tubular shaft and universal joints.

Gear ratios vary from slightly under 4 to 1 up to 12 to 1, with reduction taking place through spiral bevel gears. In double reduction units spiral bevel and helical gears are used.

Care has to be taken at bearings to keep oil in and exclude moisture. To do this a special breather system is used along with double oil seals and shields.

Lubrication is self-contained and oil can be checked or filled from outside the stack in order to avoid water getting into the operating unit.

Timken roller bearings are used in the reduction units because it has been found they serve best to carry heavy loads at conservative speeds, with high elements (resistance to deflection,) which is most necessary for proper operation of spiral bevel gears. thrust capacities. They also afford rigidity of rotating elements.

# A New Era
## in
# Relay Life and Reliability

**NEW**
Bulletin 700, Type B-220A, AC Control Relay with 2 N.O. and 2 N.C. contacts.

**NEW**
Bulletin 700, Type BX-440A, AC Control Relay can be wired for normally open or normally closed contacts.

## NEW ALLEN-BRADLEY BULLETIN 700 RELAYS
## Improved features set new performance standards

For years, Allen-Bradley Bulletin 700 Type B and Type BX relays have been preferred for their long life and trouble free operation. The improvements in the new Bulletin 700 Type B and Type BX relays will set new performance standards wherever they are used. Naturally they use the famous A-B double break, silver alloy contacts which always remain in perfect operating condition without cleaning or filing. The cast coil cannot be damaged by the severest atmospheric conditions.

These new Allen-Bradley Bulletin 700 Type B and Type BX relays offer even greater value and greater reliability than ever before—but the price has not been changed.

- **New mechanical design gives at least 5 times greater operating life.**
- **New contact motion provides 10 times greater electrical reliability.**
- **Complete interchangeability—mounting dimensions are unchanged.**
- **New hermetically sealed plastic coil fits Bulletin 700 relays presently in use.**
- **New, stronger, movable contact crossbar—also fits old relays.**
- **New reinforced stationary contact blocks—interchangeable with previous design.**

# ALLEN-BRADLEY | QUALITY MOTOR CONTROL

**Allen-Bradley Co., 1323 S. First St., Milwaukee 4, Wis. • In Canada—Allen-Bradley Canada Ltd., Galt, Ont.**

***CONSULT YOUR LOCAL ALLEN-BRADLEY REPRESENTATIVE***

**ALBUQUERQUE**
A & A Supply Co., 114 Morningside Drive, N. E., Tel: ALpine 6-0307
**DENVER 5**
Young Electric & Mfg. Co., 2134 Curtis St., AComa 2-4841
**LOS ANGELES 23**
Allen-Bradley Co., 1264 S. Boyle Ave., Tel: ANgelus 9-9421
**PHOENIX**
Edward P. Weller & Co., 1902 E. Rovey Ave., Tel: AMhurst 6-3188
**PORTLAND 14**
J. A. Tudor & Associates, Inc., 1004 S. E. Belmont St., Tel: BElmont 2-1188
**SALT LAKE CITY 10**
Stevens Sales Co., 1482 Major St., P. O. Box 2338, Tel: INgersoll 7-5489
**SAN DIEGO 1**
James A. Setchell, 301 W. "G" St., Tel: BElmont 3-3981
**SAN FRANCISCO 10**
Campbell & George Co., 1601 Cortland Ave., Tel: Mission 8-1236
**SEATTLE 1**—J. A. Tudor & Associates, Inc., 2605 Western Ave., Tel: MUtual 2-7444

*. . . for more details, circle No. 21 on Reader Service Postcard*

Ambrose-Augusterfer Corporation has been awarded the contract for all major piping in Torresdale Filter Plant —now under construction in N.E. Philadelphia. Pipe being handled weighs over 10,000 lbs. and measures 40′ by 54″ in diameter.

# Only Yale G-3 Gas

1. Wide Angle vision
2. Fast cycle operation
3. Greater load stability

Now full visibility, extra safety and handling speed for efficient, big-load operations...at low cost

Raw materials or finished goods —versatile Yale high-capacity Gas Trucks handle any type load with extra speed, safety and efficiency.

# Trucks give you all 3

Maximum visibility, easy maneuverability, high speeds, safe stability—you'll find the combination of all these vital features exclusively in new Yale G-3 Series High-Capacity Gas Trucks.

**Wide-Angle Vision**—Yale's revolutionary open-front design reduces frontal obstruction. Upright channels are nested—hoisting cylinders wide-spaced—lifting chains located in front of cylinders, out of line of sight. Driver sits high in center—has 300% more visibility!

**Fast Cycle Operation**—Yale G-3 Gas Trucks maneuver quickly into position ...lift capacity loads at speeds up to 60 feet a minute...travel as fast as 20 m.p.h....spot loads accurately. This fast, smooth operation keeps materials on the move, saves time and handling dollars.

**Greater Stability**—Low center of gravity, broad lifting base, high underclearance, side-thrust rollers, wide channel-roller spacing, large pneumatic tires—these and many other features that assure load stability are *standard* on Yale High-Capacity Gas Trucks.

Yale G-3 Gas and LP-Gas Trucks come in capacities of 15,000 to 20,000 lbs.—with fully automatic torque transmission, fluid coupling or standard transmission. Complete line available in capacities of 2,000 to 20,000 lbs.

Get the full story. Send for your free copy of Bulletin #5230. The Yale & Towne Mfg. Co., Philadelphia 15, Pa., Dept. GT-4H.

**YALE®**

**INDUSTRIAL LIFT TRUCKS**
**TRACTOR SHOVELS • HOISTS**

**YALE & TOWNE**

Yale Materials Handling Division, a Division of The Yale & Towne Manufacturing Company. **Manufacturing Plants:** Philadelphia, Pa., San Leandro, California, Forrest City, Arkansas. **Products:** Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Industrial Tractor Shovels • Hand, Air and Electric Hoists

*. . . for more details, circle No. 22 on Reader Service Postcard*

# HELICOPTERS, a new industrial tool

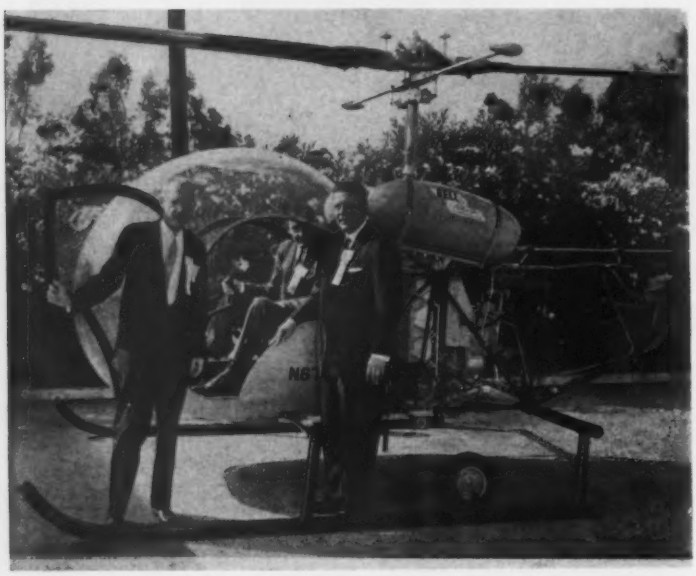
## Versatile transportation method now being used by many Western firms

ONE OF THE NEWEST METHODS OF TRANSPORT, the helicopter, is finding growing favor among Western industrial firms and transportation services.

Highest growth factors for rotor-craft in the West are in expanding fields of executive transportation, freight hauling, and aerial taxis.

These and other helicopter applications were probed during the recent Helicopter Conference, staged in Los Angeles by the Chamber of Commerce, and attracting hundreds of industry representatives to all-day sessions at the Institute of Aeronautical Sciences.

*PLANT FIRE FIGHTING helicopter is inspected by, left to right, P. J. Daniel Sr., architect, Harvey Gaylord, president, Bell Aircraft Corp.; J. W. Luhring, chairman, LA Chamber of Commerce aviation committee.*



Demonstrations were held in the IAS parking area and showed helicopter versatility in cargo handling and personnel transport. Most spectacular demonstration was the speed with which a small helicopter was able to unreel 300 ft. of fire hose, a vital factor in combatting large scale plant fires.

One Bell Aircraft helicopter comes equipped with a special tray holding 1,000 ft. of 1.5-in. water line and would be ideal for hovering operations over burning roofs, tankage, vehicles.

Many Western firms have purchased their own helicopters to transport top officials and high priority materials from plant-to-plant, plant-to-downtown, and plant to airport.

Northrop is running helicopters Monday through Friday on a fixed schedule, making eight flights daily between their Hawthorne, Anaheim, and Van Nuys, Calif., facilities. Travel time between these plants has been chopped from more than an hour to only 18 minutes.

Commercial carriers are finding rotor-craft a boon to business. According to Clarence Belinn, president of Los Angeles Airways, the company set new helicopter traffic records last June by carrying 4504 passengers, 428,461 lb. of air express, and 105,515 of other priority cargo—a 33% increase over last year.

According to Harvey Gaylord, president of Bell Aircraft, maker of a number of helicopter models, industrial firms faced with personnel and freight transport problems may well turn to this form of transport in years to come.

# DRILLING PROCESS—new use for old method

## Coal rig replaces manual in drilling blast furnace tap holes

A NEW, SAFER method of drilling blast furnace tap holes has been developed by blast furnace workers at the Colorado Fuel and Iron Corp.'s Pueblo, Colo. plant.

CF&I steelworkers have put a converted coal drilling rig to work making the tap holes. By replacing manual drilling of the clay plug which seals the furnace, the coal drilling rig enables the men in charge of the tapping to operate from a safer distance.

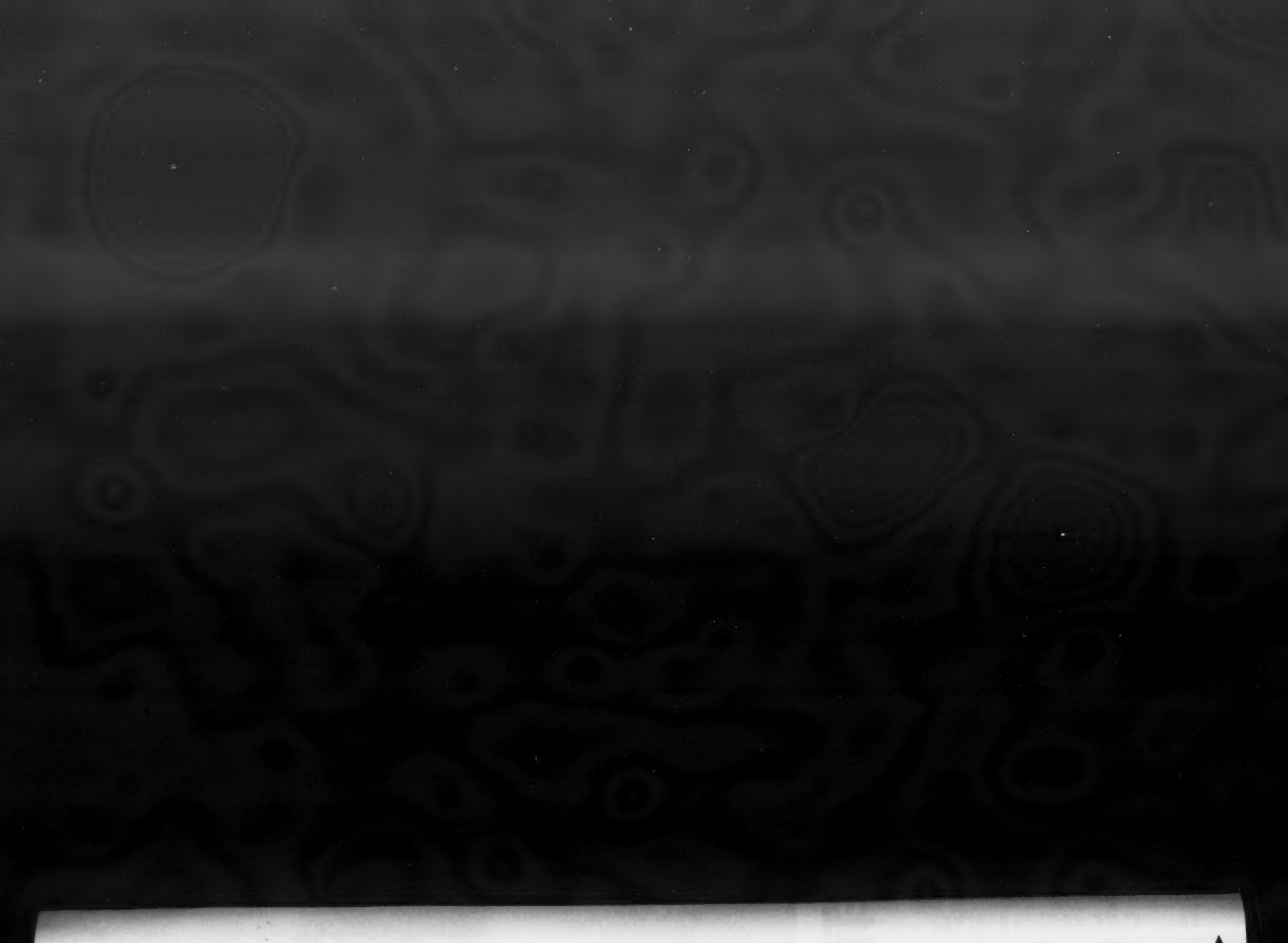
With the coal rig doing the drilling, the workers can stand well out of reach of the sparks and beads of hot metal that blow out of the hole when the drill breaks through the hearth and into the molten iron.

The drill itself consists of a jackhammer that travels on a 12-ft. chain drive feedshell which is powered by an air motor. A special rack designed by the Pueblo plant's Blast Furnace Department guides the drill into the hole as the motor is turned on and the jackhammer is propelled forward by the chain drive.

After the tap hole has been drilled, the drill assembly is lifted off the floor by an electrical hoist and moved along a trolly onto the bustle pipe where it is stored.



*. . . for more details, adv. opp. pg., circle No. 23 on Reader Service Postcard* →



# LINDE packaged oxygen plant sets nine-year record for availability!

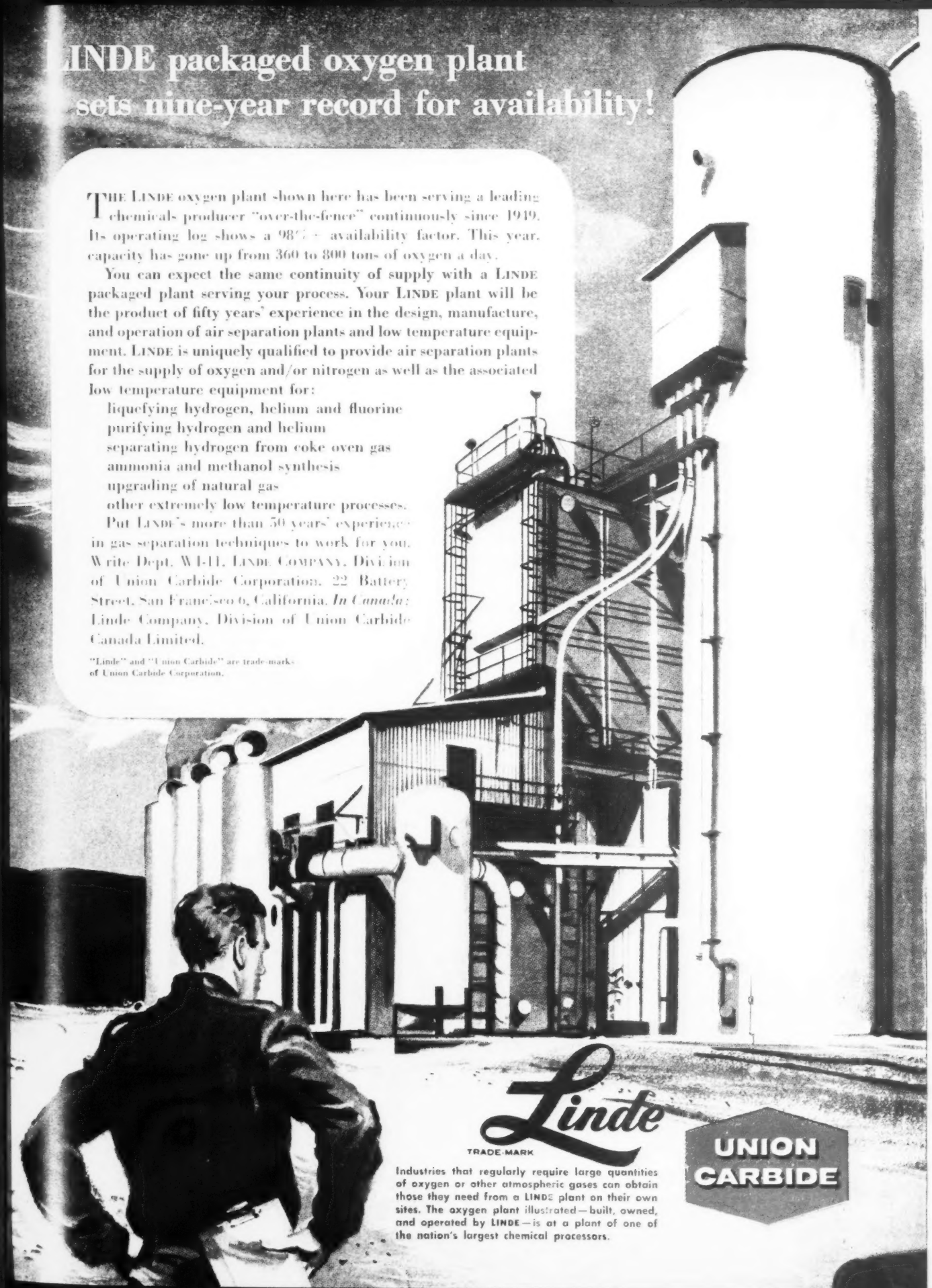
THE LINDE oxygen plant shown here has been serving a leading chemicals producer "over-the-fence" continuously since 1949. Its operating log shows a 98% + availability factor. This year, capacity has gone up from 360 to 800 tons of oxygen a day.

You can expect the same continuity of supply with a LINDE packaged plant serving your process. Your LINDE plant will be the product of fifty years' experience in the design, manufacture, and operation of air separation plants and low temperature equipment. LINDE is uniquely qualified to provide air separation plants for the supply of oxygen and/or nitrogen as well as the associated low temperature equipment for:

liquefying hydrogen, helium and fluorine
purifying hydrogen and helium
separating hydrogen from coke oven gas
ammonia and methanol synthesis
upgrading of natural gas
other extremely low temperature processes.

Put LINDE's more than 50 years' experience in gas separation techniques to work for you. Write Dept. W-11, LINDE COMPANY, Division of Union Carbide Corporation, 22 Battery Street, San Francisco 6, California. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

"Linde" and "Union Carbide" are trade-marks of Union Carbide Corporation.



Linde
TRADE-MARK

UNION CARBIDE

Industries that regularly require large quantities of oxygen or other atmospheric gases can obtain those they need from a LINDE plant on their own sites. The oxygen plant illustrated—built, owned, and operated by LINDE—is at a plant of one of the nation's largest chemical processors.

# INTRICATE CUTTING with automatic machine

## Torch automatically cuts contours and bevels in steel pipe

DIFFICULT CUTS IN STAINLESS STEEL PIPE are being done at the Hanford Atomic Plant, Richland, Wash., by a versatile machine—which is a combination of two standard products.

The combination unit is composed of the "Mechanical Draftsman," manufactured by Steffan Mfg. Corp., Salem, Ohio, and the "Heliarc" cutting torch, made by the Linde Co., a division of Union Carbide Corp.

Use of the automatic pipe cutter at Hanford was the result of investigation and developmental work done by power and general maintenance section and facilities engineering section of General Electric's chemical processing department. General Electric operates Hanford for the Atomic Energy Commission.

The pipe-cutting machine automatically contours and bevels cuts in stainless steel pipe up to 10 in. in diameter. The machine is told what to do by an operator who sets four dials. Then a button is punched, the torch flares into action and is guided into a precise cutting pattern around the pipe. In a matter of seconds the cut is finished and the torch automatically shuts off.

One of the dials is related to the inside diameter of the pipe being cut and one to the outside diameter of the mating pipe, thus obtaining the correct contour on the cut. Another dial controls the angle of intersection of the two mating pipes and another controls the distance of offset when one pipe meets a larger one off-center (thus requiring a cut deeper on one side than on the other).

A Heliarc torch is required for most of the pipe-cutting in Hanford's chemical processing department because an oxy-acetylene process contaminates stainless steel, making it unfit for the high-quality welding and corrosion resistance necessary in nuclear piping systems. The Heliarc torch has a tungsten electrode shielded by a mixture of argon and hydrogen gases and makes a clean, saw-like cut free of dross.

Until the adoption of the automatic pipe-cutter at Hanford, fitting pipes for suitable welds entailed a five-step process. First a layout had to be made, then the pipe had to be marked, sawed and burned. Finally, the cut had to be handground and beveled to proper fit.

The new machine takes care of this process in one simple operation and is capable of cutting all types of configurations. As a result, waste is eliminated and the quality of the joints is improved. In addition production is faster.

# LINING PROCESS for lower tank maintenance

## Better coating process resists corrosion, acids, algae

A TOUGH, DEPENDABLE, ANTI-CORROSIVE lining for tanks has been developed by the Roper-Webb Corp., South El Monte, Calif. Called "Rezi-Glazing," the process combats water acids, rust, algae, and strong alkaline solutions.

In perfecting this coating system, Roper-Webb has used a product formulated from Epon 1007, a Shell Chemical Corp. item, supplied by the Trail Chemical Co. of El Monte.

This Epon resin-based coating, applied to steel panels, easily survived severe tests for metal adhesion and thermal shock. Immersion tests showed that it resisted organic chlorides, detergents, salt spray, and acids, at both room and elevated temperatures.

Tank components are sandblasted inside and out for surface preparation, then completely submerged in the coating formula for 10 minutes, and withdrawn slowly to avoid sags or runs.

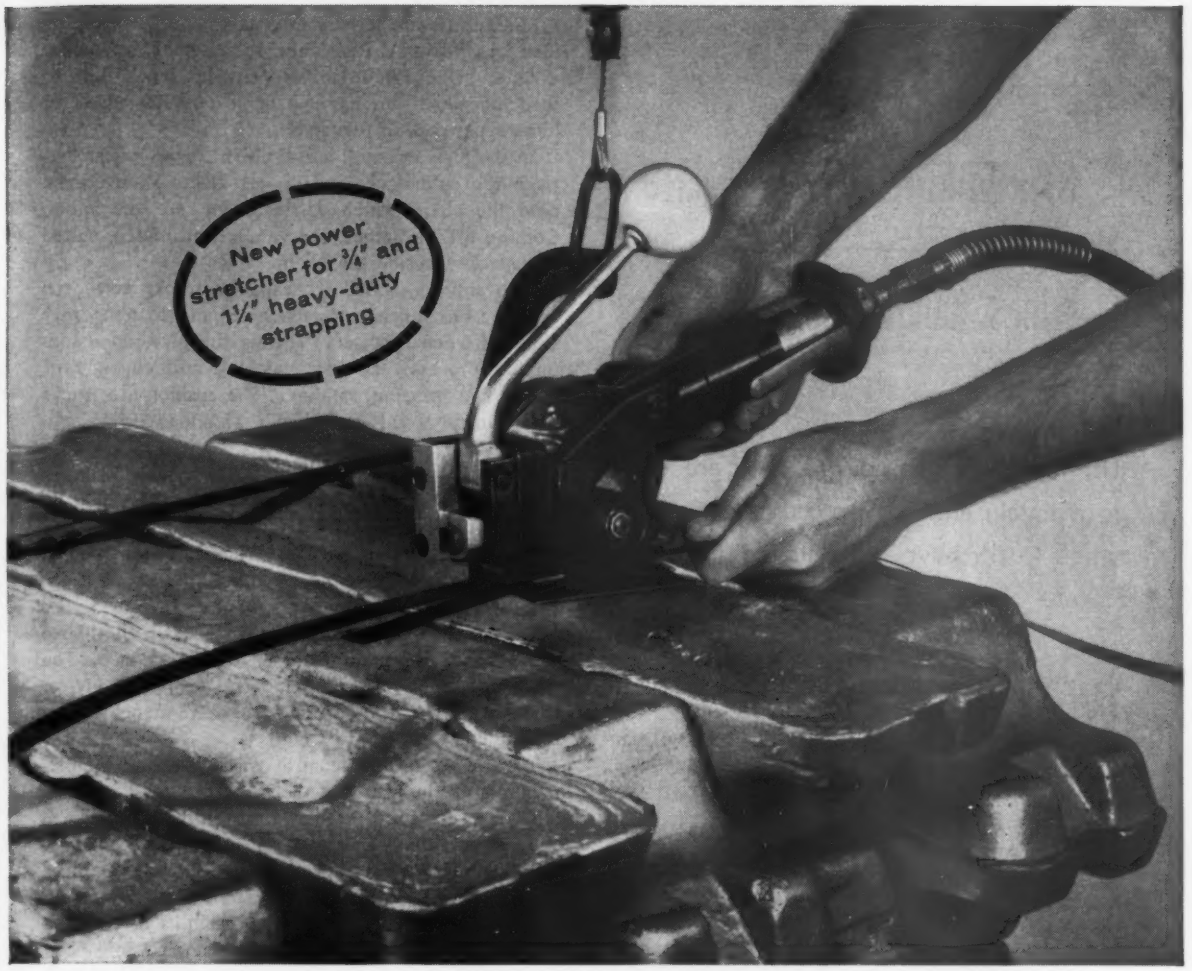
After an eight-min. drain period tanks are sent through a gas-fired curing oven, where they are held at 500° F for about 13 minutes. After sufficient cooling tanks are rerouted through the dipping vat, recured at 500° F, this time for 21 minutes. Thickness of the cured film is usually close to 1½ mil.

Roper-Webb's major output is a wide range of water softeners formed from steel sheet supplied through Bethlehem Steel Co., Los Angeles.

After shearing operations, the sheet is rolled to shape and automatically seam welded.

Dished heads are crimped onto the tanks, then automatically seam welded. Final welding operations fix leg assemblies to the bottom of the tank.

After a pressure test cycle, the Rezi-Glazing process follows, then assembly of fittings and controls. Final fabrication step is enameling and infra-red curing of exterior paint.




## Another Acme Steel portable power strapping tool . . .

# The new B1R pneumatic stretcher

**ACME STEEL COMPANY** adds still another model to its line of power-actuated, portable strapping tools. This time it's the rugged B1R Pneumatic Stretcher, an all-purpose tool for heavy-duty strapping—but with the accent on light weight and handling ease.

The B1R eliminates waste as it uses strap directly from the coil, features unlimited high-speed take-up and provides greater residual strap tension. Operation is simple: strapping threads easily into the tool, then a touch of the throttle power tensions strapping to predetermined tension. Motor holds tension until sealed joint is made. A forward stroke of the shear lever cuts strap close to the seal. This tool is readily adaptable to many different strapping applications. Mounting brackets and various types of supports are available.

Your Acme Idea Man can demonstrate the money-saving advantages of the B1R Stretcher as it applies to your packaging operations.

Ask your Acme Idea Man—or write—for free brochure on the new B1R and other Acme Steel powered strapping tools.

**Contact your *Acme Idea Man** at the nearest Acme Steel Company office. Or Write: Dept. WCU-119, Acme Steel Products Division, Acme Steel Company, 4901 Pacific Blvd., Los Angeles 58, Calif. Also San Francisco, Seattle, and Portland.

ACME STEEL **STEEL STRAPPING**

*. . . for more details, circle No. 24 on Reader Service Postcard*

# STANDARDIZING EQUIPMENT

## brings handling costs down

Lift truck and straddle carriers are easier to maintain and parts procurement simpler when trucks have been standardized.

WE COULDN'T RUN A MACHINE without a lift truck.

This is the comment of Gene Knokey, manager, plywood division, of the Diamond Lumber Co., Tillamook, Ore. But this is just one part of the story of an entire production operation built upon handling by lift truck and straddle carriers.

The lumber and plywood divisions of this company are spread over 50 acres. Principal building—housing the plywood mill and planing mill—is a former Navy blimp hanger, 400 by 1075 ft. Eight hundred employees turn out 400,000 board ft. of lumber each day and 10,500,000 board ft. (on a ⅜-in. basis) of plywood each month.

Supplying the requirements of speed and flexibility over this vast area are 24 trucks, ranging in capacity from 4,000 to 15,000 lb. Eleven of these have side-shifting forks.

Here is how these vehicles handle lumber and plywood:

In the sawmill, a straddle carrier hauls the green lumber from the chain to yard storage. Here, a 15,000 lb. capacity truck stacks the lumber. Fork lifts also remove the lumber from storage, taking it directly to the planer or to dry kilns. Lift trucks stack and unstack the dry kilns, taking the dry lumber to covered storage sheds and/or to the planer.

The planer and a trimmer and resaw are supplied with rough lumber by lift truck. The finished lumber comes off the planer chain where it is sorted by hand and stacked on bolsters. Another straddle carrier removes the finished lumber to storage. Lift trucks stack the lumber and load trucks and rail cars. Also, the fork lifts stack outbound lumber on docks adjacent to the spur track, where boxcars are hand loaded.

Four side-shift machines are used for (1) feeding the planer; (2) stacking lumber in the yard; (3) loading and unloading the dry kiln; (4) loading and unloading trucks.

"Side-shifts are terrific time savers on these particular jobs," says A. R. Richey, manager of the lumber division. One 15,000 lb. capacity lift truck used to feed the planer has handled up to 600,000 bd. ft. of lumber per day, in two shifts.

In the plywood mill, a bull chain carries peeler logs from the cold deck, and an air kicker shunts them onto the chain which carries them into the lathes. Coming off the lathes, the veneer is trimmed, sorted and stacked beside the chain.

Side shifting, 4,000 lb. capacity trucks carry the veneer from machine to machine, and to temporary storage (when necessary) during the plywood manufacture process: Drying, patching and edge-gluing, gluing and pressing, sanding. The cushion-tire trucks stack the plywood for storage, and load trucks and box cars (Note: eight-ft. plywood sheets are loaded through six-ft. doors by loading sideways). Two side-shifting fork lifts can load approximately 500,000 lb. of plywood in rail cars per day.

The 15,000 lb. capacity lift trucks are also used in the manufacture of Diamond dry kilns, made at the site for sale to other mills.

Lift trucks and straddle carriers used in the above operations were manufactured by the Hyster Co. The trucks were selected in competitive test. The Hyster trucks were found to be faster and more maneuverable for the job.

Also, ease of maintenance was a factor. Maintenance is economical and the parts are easily accessible. Each division has its own preventive maintenance shop where trucks are on a rigid maintenance schedule. Engines in some trucks have logged 300,000 miles.

Trucks were selected on the basis of size and weight of loads to be handled and on the basis of need (a certain number of jobs requires a certain number of trucks).

And these vehicles have more than met the requirements of speed and flexibility in this operation covering 50 acres.

*FEEDING THE PLANER in a lumber mill, one of many different uses for lift trucks in lumber mill operation. Mill covers some 50 acres.*

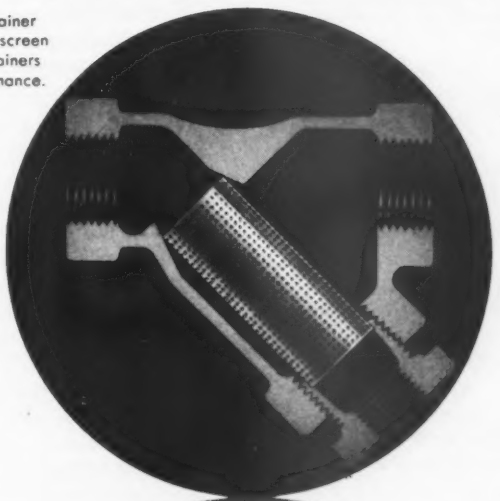
*protect your equipment against scale and dirt*

Exterior view of NEW Sarco Type "AT" Pipe Line Strainer. Note 45° blow-down angle to facilitate piping away from strainer.

*with this*

# NEW SARCO TYPE "AT" PIPE LINE STRAINER

Cutaway of NEW Sarco Type "AT" Strainer shows sediment collection chamber below screen. Standard screen used in Sarco "AT" Strainers is key to their uniformly successful performance.



Examine one of the new Sarco Type "AT" Strainers and you'll notice at once that its design is a marked improvement over that of contemporary strainers . . . in three important ways:

The Sarco screen, key element of the unit, fits tightly into a long, tapered screen seat. This feature absolutely stops the by-passing of particles around the screen. Secondly, the rigid, welded construction of heavy-gauge brass makes sure the fit will remain tight, even when trapped sediment builds up pressure.

Third, you'll see that the new AT is easy to clean. No sharp edges or weave crevices in the screen for particles to cling to. Blow-down cleaning is simplified by the 45° angle construction.

Write for Sarco Bulletin No. 1210B which gives dimensions, capacities, and technical data.

7313B

**NOTE THIS ADDED PROTECTION AND CONVENIENCE**

1. Bodies of heavy-duty 250 psi semi-steel. Tensile strength to 30,000 # per square inch minimum.
2. For maximum strength, bodies are reinforced with external rib.
3. Long, tapered screen seat assures correct screen position and tight fit without buckling.
4. Cap design provides a sediment collection chamber below screen.
5. Generous proportion of open screen area in relation to pipe size minimizes pressure drop.

**SARCO**
**COMPANY, INC.**
635 Madison Avenue, New York 22, N. Y.

**STRAINERS • STEAM TRAPS • TEMPERATURE CONTROLLERS • HEATING SPECIALTIES**

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# HELPFUL LITERATURE

**FOR THE WEST'S PLANT OPERATING EXECUTIVES**

**FOR YOUR FREE COPY — CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 75**

### FACTS ON SPEED-DRAW PRESSES WITH 80% MORE OPERATING SPEED

Why you get 80% more operating speed in a new line of speed-draw presses is pointed out by means of a graphic diagram that highlights this eight-page cardboard catalog. The illustrated literature also tells why the presses are especially advantageous for deep-draw work and often make it possible to reduce the number of operations required to form a part. Construction details and specifications for machines from 200-1250 tons in capacity are included. *Steelweld Machinery Div., The Cleveland Crane and Engineering Co.*

. . . FOR YOUR FREE COPY, CIRCLE NO. 200

### EIGHT-PAGER GIVES DATA ON BEARINGS AND PILLOW BLOCKS

In this booklet's eight blue-and-white pages you'll find complete information on a general line of ball and roller bearings and pillow blocks. Designed for easy reading, the illustrated literature provides quick descriptions of self-aligning and rigid bearings, and of unit and split pillow blocks. *SKF Industries, Inc.*

. . . FOR YOUR FREE COPY, CIRCLE NO. 201

### BROCHURE DESCRIBES SERIES OF FOUR-WHEEL DRIVE LIFT TRUCKS

How four-wheel drive lift trucks help you cope with the rough terrain problem is the subject dealt with in this four-page bulletin that outlines features of a new series of four-wheel drive lift trucks in the 15,000 to 20,000-lb. capacity range. Available in Challenger 150, 180 and 200 models, the trucks are the first conventional lift trucks to offer the all-wheel drive, allowing use of a full range of hydraulic attachments, equipment options and accessories. *Hyster Company.*

. . . FOR YOUR FREE COPY, CIRCLE NO. 202

### BUYING GUIDE FOR COMPLETE LINE OF RECORDING INSTRUMENTS

You'll find buying information on a complete line of recording instruments in this 12-page, two-color bulletin that includes dimensions and chart speeds, operating specifications, applications, features and accessories. Recorders are grouped by accuracy class, and all models are pictured. Specialized recording instruments are also described. *General Electric Co.*

. . . FOR YOUR FREE COPY, CIRCLE NO. 203

### DRAWINGS AND DATA ON AIRCRAFT BOLTS RATED UP TO 290,000 PSI

Detailed performance data on a new line of aircraft bolts rated at 260,000 to 290,000 psi. tensile strength—said to be the world's strongest—is offered in this four-page bulletin. Graphs that chart tensile and fatigue strength characteristics of the new fasteners and other comparable bolts are included, as are relative tensile strengths for various bolt diameters. Design drawings and specifications supplement the photographs and text. *Standard Pressed Steel Co.*

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### 96-PAGE CATALOG DESCRIBES WIDE VARIETY OF VARIABLE-SPEED DRIVES

The wide variety of styles, modifications and accessories available in this firm's line of mechanical variable-speed Motodrives is emphasized in this 96-page catalog. Brief copy, many photos and drawings are used to describe the units which come in capacities from ¼ through 40 horsepower. Construction features, specifications, speed and rating tables, plus pricing information are provided. *Reeves Pulley Div., Reliance Electric and Engineering Co.*

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### CURVE CROWN WELDED, ALL-STEEL PULLEY IS SUBJECT OF NEW BULLETIN

A new product—the Curve Crown welded, all steel pulley—is the subject of this new bulletin. The publication features comprehensive technical and engineering data, specifications, diagrams and illustrations about this new addition to a manufacturer's extensive line. *Stephens-Adamson Mfg. Co.*

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### NEW DIE CASTING MACHINES FOR HIGH SPEED OPERATION

A 30-page fully illustrated booklet has been released by Kux Machine Co., Chicago, Ill., detailing operation and application of 28 all-new models of die casting machines that feature massive heavy duty construction, strain gage proven die locking pressure, vacuum die casting, automatic continuous cycling, high speed operation. Die locking pressure is insured by massive steel die plates and toggle linkage with oversize pins, bushings, and tie bars that are designed to apply full, rated locking tonnage safely without excessive deflection, misalignment, wear or maintenance. *Fernholtz Machinery Co.*

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### SEVEN-POINT SCIENTIFIC SYSTEM FOR CONTROLLED BARREL FINISHING

A seven-point system for scientifically controlled barrel finishing is detailed in a 36-page, multi-colored booklet just released. The booklet sets forth size and type of media; ratio of media to parts; load height; water; compounds; barrel speed; and tumbling time. A complete line of tumbling media, barrel finishing compounds and precision barrel finishing machines and equipment is listed for the full range of tumbling operations. *The Carborundum Co.*

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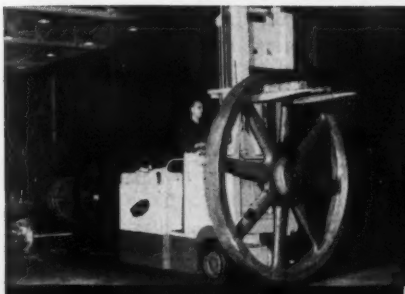
# Get The Facts On
# *ELPAR* LEASING



You can use ELPAR Leasing to put one of these cost cutting ELPAR industrial trucks to work in your plant immediately! Do it without a major cash outlay . . . and, pay the low monthly payments out of savings created by the new truck.

"Titan" Heavy Duty Fork Trucks

"Safe-Hite" Fork Trucks

## 4 Leasing Plans . . . Covering 150 *ELPAR* Models

**1 Straight Leasing:** The lowest cost form of leasing — payments are made in equal monthly installments for periods up to 5 years. Trucks complete with battery and charger may be leased. Equipment can be released as often as desired after the initial term has expired.

**2 Lease With Option To Buy For $1.00:** This plan gives you the option to buy the equipment for $1.00 at the termination of the lease.

**3 Lease With Option To Buy At Fair Market Value:** At the termination of the lease, this plan permits you to buy the equipment at the fair market value. Monthly payments under this plan are lower than the dollar option plan.

**4 Fleet Lease:** Companies planning to lease a large number of trucks will find this plan attractive and economical. Consult the main office or your local ELPAR man for details.

Low Lift Platform Trucks

Die Handling Trucks

Fork Trucks with Attachments

GET THIS FREE FACT BOOKLET . . . it contains an explanation of leasing and rate tables that permit you to estimate leasing costs. Send for it today!

"Cargo Scout" Fork Trucks

Mobile Cranes

"Air-Right" Fork Trucks

ELPAR
ELECTRIC TRUCKS

THE **ELWELL-PARKER** ELECTRIC COMPANY
4205 ST. CLAIR AVENUE • CLEVELAND 3, OHIO
In Canada: International Equipment Company, Ltd.

**TWICE THE LIFE . . . ONE THIRD THE OPERATING COST**

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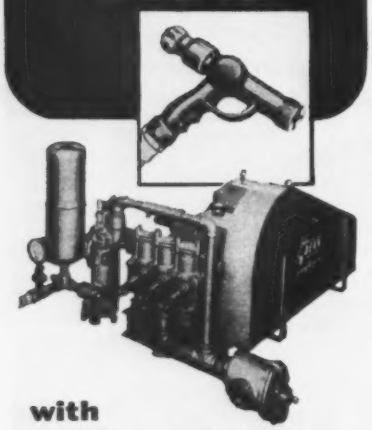
# Reduce Washing Costs



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## John Bean AQUABLAST

*High Pressure*

## WASHERS

*One man using AQUABLAST equals a crew of men using ordinary water pressure!*

The fast, efficient cleaning made possible by John Bean High Pressure Aquablasting is saving industry thousands of dollars annually in clean-up costs. In just seconds, the hard hitting, super-cleansing Aquablast stream cuts caked dirt, hardened cement, gummy residues, accumulated grime and dozens of other hard-to-remove substances that previously required hours of scrubbing and scraping, or strong chemicals to wash away.

**SEND FOR COMPLETE INFORMATION ON 'AQUABLASTING' TODAY!**

*75th ANNIVERSARY*

fmc *Putting Ideas to Work*

**John Bean** ®Division

**INDUSTRIAL PUMPS**

San Jose 1, Calif. Lansing 4, Mich. Dept. WI-14

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### NEW IMPROVED DIE ALLOY FOR STAINLESS, MILD STEEL

A new improved die alloy for drawing, forming or bending stainless and clean, mild steel is described in a four-page bulletin. The new alloy, called DiBronze, provides longer life between dressings, has improved machining qualities and offers better impact resistance. Galling and scratching are practically eliminated. The bulletin includes advantages and typical applications of the new alloy, as well as a complete listing of available stock sizes. *Ampco Metal, Inc.*

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### CONDENSED CATALOG ON SPRAY GUNS FOR DIE LUBRICATION

A condensed and simplified catalogue sheet covering spray guns for die lubrication is now available. Included are specially designed automatic guns for applying lubricating oils or drawing compounds to dies or all types of coolants to abrasive wheels and to belts. Other automatic spray guns, for use in similar applications, but varying in size are listed with full specifications and accessories. *The DeVilbiss Co.*

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### COMPLETE LINE OF IN-LINE HELICAL GEAR SPEED REDUCERS

Information on industry's most complete line of helical gear speed reducers is contained in this new 20-page book. It consolidates all of this company's expanded line of In-Line helical gear speed reducers in a single catalog, provides complete selection data on 20 reducer sizes in double, triple and quadruple reductions. *Link-Belt Co.*

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### NON-REVERSING COMBINATION STARTERS THROUGH SIZE 4

The manufacturer has issued a new 8-page folder covering a complete line of non-reversing combination starters through NEMA size 4. Data provided in the publication includes descriptions, photos and enclosure dimensions for all popular combination starters with either motor circuit swiches or with circuit breakers. *Cutler-Hammer Inc.*

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### COMPRESSED AIR COMBINATIONS— FILTERS, REGULATORS, COMBINATIONS

This data sheet supplies details on compressed air combinations that can be used in all types of circuits. They can be used for filtering, regulating, and lubricating—singularly or in all combinations. They offer low pressure drop plus many other benefits. *Wilkerson Corp.*

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### GAS FLOW CONTROL EQUIPMENT DESCRIBED IN 12-PAGE CATALOG

Gas flow control equipment for argon, helium and carbon dioxide ($CO_2$) is the subject of this 12-pager which describes operation and various applications for this equipment, with photographs of each type. The catalog covers recent additions to this equipment group—a series of fixed-pressure regulators with flow adapters. Details on a demand type proportioner for customers requiring special gas mixtures for pipeline distribution systems are also given. *Air Reduction Pacific Company.*

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### NEW INDUSTRIAL FURNACES FOR ALL HEAT PROCESSING

All types of heat processing applications are possible with the furnaces detailed in this six-page folder. A chart inside shows what furnace and atmospheres to use with what heat processing application. Large photos show actual installations of each furnace. *Sunbeam Equipment Corp.*

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### GAS-SHIELDED, METAL-ARC WELDING WIRE FOR ALL USES

This 84-page booklet has been brought completely up to date to include the latest information on a complete line of gas-shielded metal-arc welding wires, including data on the improved A675 Steel wire, and the new A666 Steel and A556 aluminum. The guide provides convenient answers to every pertinent question concerning steel, aluminum, copper and copper base, stainless steel, titanium and special welding wires used with this Aircomatic welding process. *Air Reduction Co., Inc.*

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### WELDING QUARTERLY DESCRIBES OVERLAY, GEAR REPAIR, METAL FABRICATION

Details about a 7,500-ton press ram overlaid with 5,000 ft. of aluminum bronze filler metal are featured in the third quarter issue of this welding firm's periodical. Directed to users of bronze welding electrodes, the welding news publication includes articles about overlaying of automotive trim dies, repairing cast-iron gears and fabrication of metal furniture. Data on a new line of extruded rectangles is also provided. *Ampco Metal, Inc.*

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### PRECISION TEMPERATURE CONTROLS USED IN INDUSTRIAL PLANTS

"Precision Temperature Controls in Industrial Plants" is the title of a new 8-page folder. Line drawings portray how controls are used in gas exhaustion chambers, tempering tanks, pipelines, test ovens, plating tanks, electrostatic spravers—and air temperature and radiant heat applications. Also included are brief descriptions of controls suitable for these purposes. *Fenwal Inc.*

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### 40 PAGE CATALOG OUTLINES COMPLETE CASTER, WHEEL LINE

The complete line of casters and wheels manufactured by Rapids-Standard Co., Inc., is fully outlined in an all-new 40-page catalog offered by the manufacturer. Introduced in the catalog are the new heavy duty series and the new Rapistan pneumatic series. A special feature of the catalog is a two-page index designed to simplify the checking of caster or wheel specifications for anv particular application. *Rapids-Standard Co., Inc.*

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### BULLETIN COVERS FULL LINE OF VARIOUS INDUSTRIAL TRUCKS

This bulletin describes and illustrates in detail rider-type electric and gasoline powered fork trucks, the exclusive side-loading Traveloader, either gas, electric, L.P., or diesel operated, electric platform trucks and electric crane trucks. *Baker Industrial Trucks.*

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**Here's the Easiest FLEXIBLE COUPLING to ASSEMBLE or DIS-ASSEMBLE**

Due to Single Slab-Sided Connecting Pin Construction

★ All Teeth Hardened — Hubs and Bores Remain Soft to Permit Reworking. Also Available in Finished Bores including Keyway and Setscrew.

★ Constant Power Transmission
★ Positive — Yet Flexible
★ Maximum Flexibility
★ Rugged
★ Durable
★ Minimum Backlash
★ Higher H.P. Per Given Diameter
★ Economical
★ Compact

Acme Flexible Couplings are quickly assembled or dis-assembled by means of a chain that has only one pin to connect or remove. Connecting links are permanently positioned on chain to engage connecting pin without difficulty in assembly. Positive Power Transmission is assured, with provisions for both angular and parallel misalignment. They absorb shock loads, provide maximum flexibility with minimum backlash. All steel construction to give maximum life expectancy. You save money in the *long run.*

Write Dept. 2-T for Special Catalog CPI-57 on Flexible Couplings.

*Acme Flexible Couplings and Roller Chains are available nationally through your local Industrial Distributor. Be sure to specify ACME.*

Call ACME for Service

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

COMPLETE LINE OF ROLLER CHAINS AND SPROCKETS • DOUBLE PITCH CONVEYOR CHAINS • STAINLESS STEEL CHAINS • CABLE CHAINS • FLEXIBLE COUPLINGS • STANDARD AND SPECIAL ATTACHMENTS

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# Shuford's NEW ELECTRICAL TAPE

## SHURTAPE® EV-57

**A VINYL PRESSURE-SENSITIVE TAPE FOR HIGH VOLTAGE INSULATION**

Here's a vinyl tape which combines desirable electrical characteristics with high resistance to oils, corrosive chemicals, humidity, fungus and mildew . . . conforms to irregular surfaces . . . works easily in limited areas.

Use it . . . to protect splices and connectors in power control leads. Use it . . . to insulate high voltage motor leads. Use it . . . on bus bars . . . as pipe wrap . . . to insulate wires and splices in junction boxes and TV-Radio installations.

Use Shuford's new SHURTAPE EV-57 wherever high dielectric strength, high insulation resistance, high stretch, high strength and excellent adhesion are required.

*Ask your*
**ZELLERBACH PAPER COMPANY**
**Representative**
*or write*

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CLOTHES LINES • TWINES
PRESSURE-SENSITIVE PAPER TAPES
SASH CORDS • WEATHER STRIPPING
COTTON & RAYON YARNS • EXTRUDED PLASTICS

**World's Largest Manufacturer of Cotton Cordage** 3083

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### STEEL BAND CONVEYORS TO SOLVE YOUR PROBLEMS

Conveyors can easily be adapted to your waste and scrap disposal problems. This 16-page manual pictures and describes the uses of an unusual type of conveyor—the steel band conveyor. It can be used in many different arrangements and in many different ways. Bands can be flat, troughed, jointed or perforated. *Sandvik Steel Inc.*

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### SOME 375 CHEMICALS FOR INDUSTRIAL USE

This 44-page compilation, "Products of The Dow Chemical Company," lists the properties and uses of some 375 industrial, pharmaceutical, and agricultural chemicals currently produced. The listing includes established products and developmental items. The new edition features an expanded section on plastics and coating products. New sections are included on oxazolidinones, automotive chemicals, textile fibers, and the company's Dowell division. *The Dow Chemical Co.*

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### HIGH STRENGTH STEEL FOR AIRCRAFT, MISSILES

This booklet, entitled "Potomac, A High Strength Steel," is 24 pages long, and contains numerous graphs and charts on this chromium-molybdenum-vanadium hot work steel. The steel, known as type H-11, is noted for its high strength up to 1000 degrees F, and is used in landing gears, solid propellant rocket cases, structural sections of aircraft and missiles, and many other applications. *Allegheny Ludlum Steel Corp.*

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### A BRAND NEW ADDITION TO PIPELINE STRAINERS

This bulletin describes a brand-new addition to the line of self-cleaning pipeline strainers in sizes from ¼" through 3". Features of this new strainer are the high strength construction of the bronze bodies, long, tapered screen socket, that insures tight fit of the screen cylinder without buckling, perforated heavy gage with spot welded lap seams that insure maximum rigidity with smooth inner surfaces, built-in sediment collection chamber integral with cap, and 45° blow-down connection angle. *Sarco Co.*

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### 12-PAGE BROCHURES GIVES DESIGN DATA FOR ALUMINUM CHAIN LINK FENCING

Design considerations, components and accessories for aluminum chain link fencing are highlighted in this 12-page illustrated brochure. It covers such topics as post spacing and anchorage, bracing, weight of fabric and mesh size and finishes. Detailed drawings show types and components and tables provide data on recommended alloys and suggested specifications. *Kaiser Aluminum & Chemical Corp.*

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### HOW ELECTRIC INDUSTRIAL TRUCKS SERVE THE FOOD INDUSTRY

How electric industrial trucks serve the food industry is the subject of this eight-page booklet that describes applications in food processing plants where cleanliness is most important. The publication discusses food warehousing telling how low maintenance costs and dependability can be obtained by use of Elpar trucks. Of particular interest to frozen food processors is data on handling requirements. *The Elwell-Parker Electric Co.*

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### RECIRCULATED GAS FOR BOILER OPERATIONS

Recirculated gas is the subject of a new 16-page bulletin. The booklet defines recirculated gas as the process by which gas from the boiler, economizer or air heater outlet is reintroduced to the furnace by means of a suitable fan and ducts. It then discusses in logical sequence the thermodynamic effect of recirculated gas, the mixing of recirculated gas with combustion gas and its application to boiler design and operation. A number of line and bar graphs and boiler drawings supplement the text. *Babcock & Wilcox Co.*

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### METAL RETAINED SEALS THAT HAVE A MEMORY

Specification and application data is available on a series of metal retained seals that are based upon controlled confinement of a seal "gland" that has a "memory." Each seal is pictured and described with engineering drawings. Recommended usage covers a wide range of industrial applications. *Parker Seal Co.*

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**BROCHURE GIVES BASIC STEPS FOR BETTER ROOF MAINTENANCE**

The subject of planned roof maintenance, a topic of increasing importance, is thoroughly covered in this illustrated 34-page brochure that starts out with four basic steps for a successful maintenance program. It explains the three forms of asphalts and details five maintenance methods and provides a guide to preparing the specification. A section on industrial asphalt products for waterproofing, surfacing and other uses will give you additional helpful data. *Flintkote Co., Pioneer Div.*

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**FOUR-PAGE FOLDER DESCRIBES FLOW CONTROL REGISTER**

A practical means of achieving numerical control of materials in a flow system is explained in this four-page folder about a new conveyor product, the flow control register. Accurate unit counting, lot plus total registration, accumulation control and remote control activation are some of the useful functions mentioned. The booklet also covers application features, accessories and specifications. *The Rapids-Standard Co., Inc.*

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**CONDENSED GUIDE COVERS FULL LINE OF TRACKS AND ATTACHMENTS**

The multitude of uses for industrial trucks is pointed out in this condensed guide that covers four different basic types, plus a host of attachments and options. The eight-pager illustrates the complete line, ranging from 1 to 40,000-lb. capacity, and gives performance data, dimensions and equipment specifications for the SpaceSaver cushion tire lift trucks; Challenger pneumatic tire models, Straddle Truck carriers and the Karry Kraneyard crane. *Hyster Co.*

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**COMPLETE RANGE OF AC-DC POWER SUPPLIES**

Complete range of AC and DC industrial power supplies to regulate voltage, current or power for industrial processes is included in this booklet. These systems are designed to handle input to 15 kv, single phase or three phase, 25-60 cycles; output ratings to 100,000 amp., single phase, two phase, three phase or direct current. *Hevi-Duty Electric Co.*

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*The CF&I Image assures precision-made*
**Industrial Wire Cloth**

**Symbol of dependable steel products for industry, the CF&I giant offers wire cloth for many uses . . . filter cloth, window and machinery guards, reinforcing materials, industrial processing and conveying components, decorative uses and many others.**

**Whatever the application, you get these advantages in CF&I Industrial Wire Cloth:**

- **Wide variety of sizes and metals—CF&I Industrial Wire Cloth is available from 6" openings down to 200 mesh. You can specify from a wide range of metals—steel, galvanized steel, stainless steel, aluminum, brass, copper, monel and other alloys.**
- **Tight weave; square, even mesh—CF&I's years of fabricating experience provide a strongly woven cloth that assures accuracy, long life and an attractive appearance.**

**The CF&I Image offers other dependable steel products:**
***Coburn Overhead Conveying Systems, Sliding Door Hardware, Fire Door Hardware and Wissco Woven Wire Processing Belts.***

**For quick price and delivery information on any CF&I product, contact our nearest sales office.**

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**INDUSTRIAL WIRE CLOTH**
**THE COLORADO FUEL AND IRON CORPORATION**

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*In the East:* **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
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western industry

# NEW EQUIPMENT

FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE

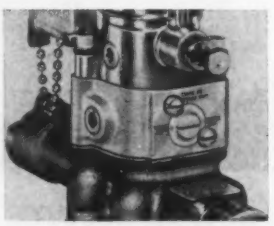
**USE RIP OUT POSTCARD, PAGE 75, FOR MORE INFORMATION ON PRODUCTS DESCRIBED**

**NEW SPIRAL REAMER**
**. . . world's finest hand reamer for 3½ to 4-in. pipe and conduit**

In just seconds this new spiral reamer smooths the inside edges of 3½" to 4" pipe and conduit . . . eliminates slow, costly hand filing. Ratchet handle speeds work in tight quarters. Seven spiral cutting edges pare off metal with least effort . . . no chatter. Hand grip has large pressure plate for comfortable application of body pressure when necessary. Hollow reamer construction reduces weight for easy handling and carrying ease. Hardened tool-steel cone is removable for sharpening. *The Ridge Tool Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 250

**UNIVERSAL TIMING SEQUENCE HEAD**
**. . . eliminates timers, relays**



A new universal timing sequence head, for use on all Valvair Speed King and Inline Valves to eliminate timers and relays in circuits requiring time delay in valve function, is announced. The new sequence head is designed to time in, time out or to both time in and time out. Delay in valve function from 0 to 30 seconds is provided by the standard sequence head. According to the manufacturer, delay can be extended up to several minutes by connecting an accessory reservoir to the port provided in the head. A readily accessible micro-threaded metering pin in the side of the head is used to set the desired delay interval. Repeatability is said to be within 2%. *Valvair Corp.*

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**LOAD GRIPPING DEVICES**
**. . . below the hook type**

The Grip Lifter line contains a comparatively complete selection of especially designed plate lifting clamps, tongs, hooks and grips in a range of types and sizes to meet most any material handling need. Five types of plate lifting clamps are offered in sizes from 1000 pounds through 40,000 pounds capacity. Three of them are vertical type with a cam gripping action, with choice of chain or shackle connection and safety lock; a fourth is a horizontal type with cam gripping action; and the fifth is a set screw type, suitable for both vertical and horizontal use. *Shaw Box & Crane Div., Manning Maxwell & Moore.*

. . . FOR MORE DETAILS, CIRCLE NO. 252

**TEFLON THREAD TAPE**
**. . . assures leakproof joints**

Thread Tape provides leakproof threaded pipe joints for UPVC (unplasticized polyvinyl chloride), stainless steel, aluminum and other corrosion-resistant piping. Made of duPont's chemically inert "Teflon," the thread tape is unaffected by corrosive materials, is self-lubricating and prevents joints freezing. Easy application, wrapping the tape around the threads one turn and overlapping the starting point slightly, speeds assembly and disassembly. *Tube Turns Plastics, Inc.*

. . . FOR MORE DETAILS, CIRCLE NO. 253

**COUNTERBALANCED TRANSPORTER**
**. . . ideal for the paper industry**

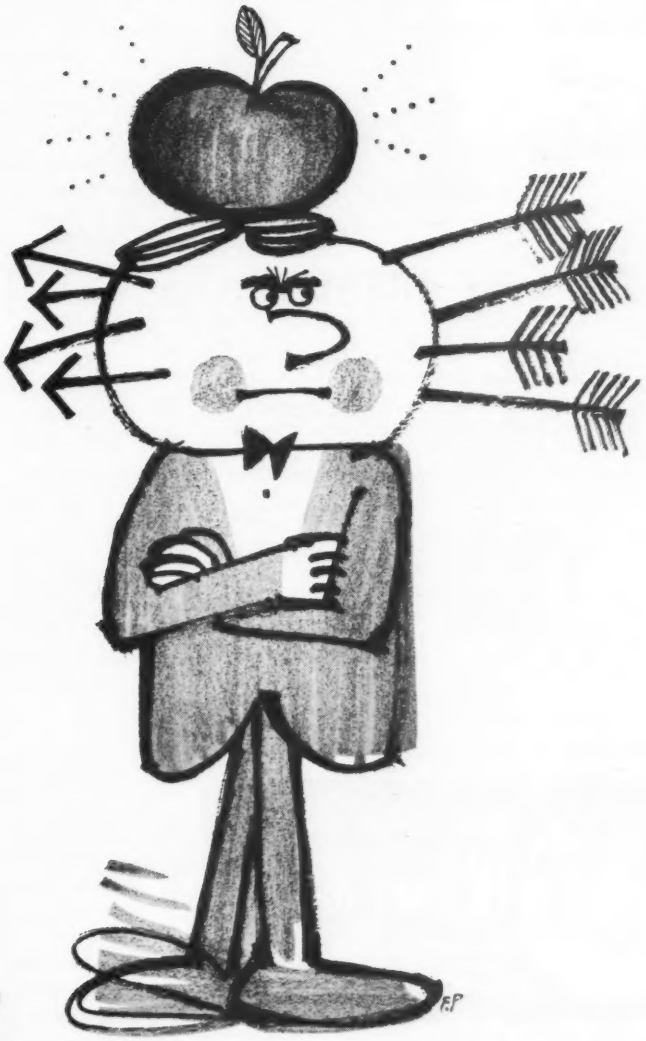
Handling paper rolls weighing up to 2200 pounds can now be done faster, more efficiently and with greater economy through the use of a new counterbalanced operator-led Transporter truck. The Transporter is ideal for companies requiring intermittent movement of loads. This operator-led Transporter has a capacity of 4000 pounds, and when equipped with a revolving paper roll attachment will handle rolls 40 inches in diameter and weighing up to 2200 pounds. The attachment can be furnished with 90 to 360 degree rotation and with quick disconnect coupling to convert it to a standard fork truck in a matter of minutes. *Automatic Transportation Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 254

**ONE-MAN TUG BAR**
**. . . motorized pry bar can move as much as seven tons**

Called the efficient answer to close quarter load-handling problems, this device can be used anywhere there's room enough for a man to stand. Electrically powered, it can move machinery into tight, previously unusable areas. The 110-lb. bar has received wide use on shipping docks and cargo aircraft as well as in warehouses and freight forwarding firms. *Western Gear Corp.*

. . . FOR MORE DETAILS, CIRCLE NO. 255



# IT PAYS TO RELY ON A SPECIALIST

One industrial plant saved $23,530 a year on parts replacements and maintenance costs. Another cut machinery downtime by 36% in three years. A transport company got one-third more mileage between lube jobs. A forging shop extended the bearing life on its drop hammers by five years apiece, saving $1,152 every ten months. How did they do it? By relying on a specialist in lubrication . . . Mobil. Mobil Correct Lubrication service may sometimes include planning a whole preventive maintenance program for a factory—or blending and testing a special lubricant for special machinery—or figuring how to filter and re-use lubricants instead of throwing them out. In countless ways, many industrial firms can improve their profits with a Mobil program of Correct Lubrication.

MOBIL CORRECT LUBRICATION
*General Petroleum Corporation—A Socony Mobil Company*

Mobil

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Problems in metal cleaning?

# Here are your answers!

In this new, big, illustrated booklet Oakite furnishes the complete facts on metal-cleaning techniques, electrocleaning, pre-paint treatment, paint stripping, pickling and etching, ultrasonic cleaning. Free, of course. Write for your copy today. Oakite Products, Inc., 1001 E. First St., Los Angeles 12, or 681 Market St., San Francisco 5.

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50 1909-1959 years' leadership in industrial cleaning
SCIENCE

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**SURESEAL MOST SPECIFIED WHERE**

- ✔ the handling of acids and other corrosive materials demand maximum hand protection.
- ✔ production requirements prescribe fast, sure handling of caustic liquids.
- ✔ positive protection against crippling and disfiguring accidents is a necessity.
- ✔ longer glove life is needed.

Surety Sureseal Gloves, (made from Hycar) give positive protection against the greatest number of acids and other corrosive liquids and wear up to 14 times longer than competitive materials. They are more snag, abrasion and puncture-proof and the exclusive Surety Turn-Cuff gives added protection for arms and prevents liquid from getting into the glove.

Tell us your requirements and test a pair today — at our expense. Write on your letterhead naming your glove jobber and you will receive a pair by return mail.

THE SURETY RUBBER CO.
CARROLLTON, OHIO

WESTERN SALES REP.: The Macintosh Co., 3030 Bridgeway, Sausalito, Calif.

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**WELDING, CUTTING OUTFIT**
**. . . includes "How-to-Weld" booklet**

With this new outfit, operators can weld steel up to ⅜ in. thick, cut up to 1-in. steel plate, braze and hard-face. It's composed of one oxygen and one acetylene regulator; a welding torch with three tips; a cutting attachment and tip; a pressure mixer; welding goggles; 12½ ft. of neoprene lined twin hose with connections; a spark-lighter and an all-purpose wrench, all packaged in a metal carrying case. *Air Reduction Pacific Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 256

**LAMINATE TRIMMER**
**. . . incorporates new power, precision features**

This new laminate trimmer incorporates power and precision features hitherto unavailable in such tools. The principal advantages include compactness, for ease of control, incorporated in a design which permits utilization of ample power for heavy-duty production work. In operation, the new trimmer can be set for high-precision requirements with adjustment controls so fool-proof as to make spoiling work virtually impossible, a valuable asset in working on high-priced laminates. *Black & Decker Mfg. Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 257

**OVERLOAD-SAFETY CONVEYOR CONTROL**
**. . . conveyor can be stopped by pull on a trolley hanger**

To be sold as a component of the "Chainless" and "Cable-Way" conveyor systems, this control can be used on any conveyor with electric motor drive. By setting the safety pointer above normal load, the conveyor motor halts when line pull exceeds this limit. Protection against under-lubrication, trolley and drive-motor damage, "hang-up" damage, and injury are among its design advantages. *Conveyor Div. of American Monorail Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 258

**LIGHTWEIGHT FLOOR TRUCKS**
**. . . freewheeling, easy to operate**

"Structo-Lite" Trucks, a new series of lightweight, all aluminum floor trucks, are now being manufactured. "Structo-Lite" Trucks are for handling a variety of materials in warehouses, terminals, manufacturing plants, textile mills, meat packing plants, department stores, dairies, food processing plants—wherever lightweight, easy rolling, more payloads and corrosion-free properties are required. About ⅓ lighter than steel trucks of the same size and equipped with free wheeling tires, these trucks are easier to operate, thereby releasing man-power for more frequent and larger loads. *Nutting Truck and Caster Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 259

# "POP" RIVETING
## ...is as easy as-

**1** **SIMPLY INSERT THE "POP"* RIVET INTO THE RIVET GUN.** Hand operated or power guns are available depending upon your needs. "POP" Rivets can be used to fasten all materials . . . metals to metals, metals to plastics, and plastics to plastics.

**2** **INSERT THE RIVET IN THE PRE-DRILLED HOLE.** Bring the rivet to the work . . . not the work to the fastener. No lock washers or jam nuts are required. INSTALLED COSTS ARE LESS than any other type of fastener requiring a pre-drilled hole.

**3** **AND SQUEEZE.** The "POP" rivet "pops into place." Being a hollow "blind" rivet, the "POP" Rivet clinches from the head side only . . . you can place the rivet anywhere . . . even in those hidden areas because "back-up or bucking" is eliminated.

**HUGE INVENTORY AND SERVICE CENTER**
The Universal Molding Company maintains a very complete stock of sizes and styles of "POP" Rivets and "POP" Rivet tooling. In addition, Universal also offers the only "POP" Rivet service repair in Southern California.

Phone or write for complete information. A Service Engineer will be happy to demonstrate the many uses of "POP" Rivets anywhere in Southern California.

*Trade Mark-Manufactured by United Shoe Machinery Corp.

**Universal**
**MOLDING COMPANY**
10807 Stanford Avenue
Lynwood, Calif. NEvada 6-9721

. . . *for more details, circle No. 34*

# how the *Peer* is put in *Peerless Electric*®

• Testing to AMCA specifications and codes is constantly under way in the Peerless Electric Quality Control and Research Laboratory. Here proper instrumentation measures the H. P. input to the blower as it is transferred through the shaft to the blower wheel . . . all a part of Peerless Electric research and quality control.

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**PEERLESS ELECTRIC DIVISION** W. MARKET ST. **PORTER** **H. K. PORTER COMPANY, INC.** WARREN, OHIO

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION, PEERLESS ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A., and in Canada, Refractories, "Disston" Tools, "Federal" Wire and Cable, "Napcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

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**Norman S. Wright & Co.**

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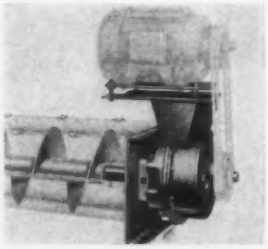
. . . *for more details, circle No. 35 on Reader Service Postcard*

**FILM-BACKED TAPE**
**. . . resists corrosives, extreme temperatures**

Find out about a transparent, film-backed tape designed to resist water, acids, alkalies and other strong solvents as well as wide temperature ranges. Made with transparent vinyl film backing, this tape closely resembles other transparent film tapes but has greater industrial versatility. It is being used successfully now for a variety of packaging applications. Expected to replace cellophane tapes in some areas, this tape is exceptionally clear and readily usable with most manual, semi-automatic and fully-automatic dispensers and applicators. *Minnesota Mining & Mfg. Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 260

**COMPACT HELICAL GEAR DRIVE**
**. . . designed for screw conveyors**



This new compact helical gear drive is designed especially for screw conveyor installations. Various drive assemblies can be furnished from stock . . . the basic drive (reducer with drive shaft and seal housing) can be combined with standard trough end as well as with the new Motor Mount. The screw conveyor drives are manufactured in six sizes, each with ratios of 4:1, 9:1, 14:1, and 24:1, assuring correct selections for all conveyors requiring ½ to 30 hp. *The Falk Corp.*

. . . FOR MORE DETAILS, CIRCLE NO. 261

**AIR CONTROL is Cost Control!**

**Reduce Operation and Maintenance Costs**

New devices for cutting costs

LUBRICATOR

3-WAY CONTROL—regulates, lubricates and filters—simultaneously, only 2 connections necessary.

3-WAY CONTROL

Balanced piston REGULATOR for accurate control and long trouble-free service.

REGULATOR

Automatic LUBRICATOR meters a protective oily mist to tools and instruments.

Cyclonic, dual FILTER action eliminates costly repairs and replacement of air tools.

FILTER

Any combination of units available in one-piece housing.

Investigate—send for Bulletin No. 80F.

**PERFECTING SERVICE CO.**

**332 Atando Ave. Charlotte, North Carolina**

Baltimore - Buffalo - Chicago - Cleveland - Camden - Los Angeles
New York - Providence - Montreal - Toronto - Hamilton, Canada

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**14-IN. TILTING ARBOR CIRCULAR SAW**
**. . . can cut 3½-in. stock at a 45-deg. tilt**

First Delta circular saw in its size range, this new saw offers heavy duty capacity, massive ruggedness, positive accuracy and extra safety. For use with a 3 or 5-hp. motor, it has extra heavy trunnions, completely jam-proof operation, four V-belt drive, a super-safe blade guard, a full 17 in. of table in front of blade at maximum blade height, and several other design advantages. *Rockwell Mfg. Co., Delta Power Tool Div.*

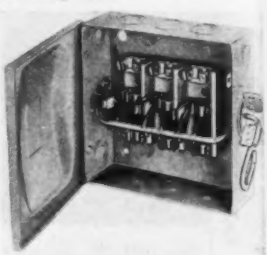
. . . FOR MORE DETAILS, CIRCLE NO. 262

**MINIATURIZED TOGGLE SWITCHES**
**. . . space-saving, faster operation**

Available with or without gold contacts or turret-type terminals, this series of pull-to-unlock toggle switches features a lever locking device to hold the toggle lever in position and requires a pull of .090 in. to change postions. Accidental lever movement is prevented. An oversize, knobbed end makes switching fast, even with gloves. Switches have a threaded bushing for panel mounting; compact design makes them ideal for aircraft, mobile and other applications where space or weight is critical. *Micro-Switch Div. of Minneapolis-Honeywell Regulator Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 263

**SAFETY SWITCHES FOR CARTRIDGE FUSES**
**. . . combine compactness with ample wiring room**



Rugged stationary contacts, visible copper knife blades, ample knock-outs, sturdy box construction and a spring-assisted release that holds the switch in "Off" position are features of these new 30 and 60-amp., 240-v. switches. Suitable for light-duty industrial equipment such as refrigeration and plant conveyor units, they are available in 2, 3 and 4-pole, fusible and non-fusible types. *The Arrow-Hart & Hegeman Electric Co.*

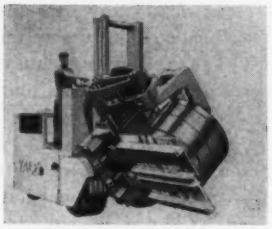
. . . FOR MORE DETAILS, CIRCLE NO. 264

**NEW SLOTTED ANGLE**
**. . . with exclusive galvanized finish**

This new material provides the answer to many construction problems, such as building storage racks, stock carts, tables, work stands, maintenance platforms, machine guard, electrical brackets, overhead supports, etc. Available in both 12 and 14 gage cold rolled steel, with an exclusive galvanized finish, the new slotted angle is made with pre-punched holes and pre-measured cutting marks to facilitate accurate cutting. *The Rapids-Standard Co., Inc.*

. . . FOR MORE DETAILS, CIRCLE NO. 265

**UPENDING, ROTATING ATTACHMENT**
**...ram, fork device for heavy duty electric trucks**



To simplify the handling of coiled steel either placed flat on pallets or in an upright position, this company has developed an upending and rotating ram and fork attachment for use on heavy duty electric trucks. Twenty-one separate hydraulic functions control the six major movements of a load possible with the new device. Capacity of the attachment ranges from 15,000 to 20,000 pounds to accommodate the majority of coils presently being handled in conjunction with pallets. *Yale & Towne Mfg. Co.*

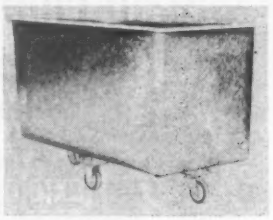
. . . FOR MORE DETAILS, CIRCLE NO. 266

**NEW ALUMINUM WELDING WIRE**
**...for welding high tensile aluminum alloys**

A new addition to the line of aluminum filler wire for use with Aircomatic and Heliweld welding processes, this aluminum welding wire is for welding high tensile alloys used in construction of missile structure, ship superstructures, truck frames, storage tanks, etc. The wire is usable in all types of structural aluminum fabrication where post heat treatment is not feasible in producing high strength welded joints. Available in Type "A" finish, it has been cleaned and treated to produce a consistently uniform surface. *Air Reduction Pacific Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 267

**LIGHTWEIGHT FIBREGLAS BOX TRUCK**
**...impervious to steam, oil, mild acids and alkalies**



Lighter than aluminum, yet practically indestructible, this box truck of chrome impregnated fibreglas will withstand temperatures from -40 to 212 deg. F., and for short exposures up to 250 deg. F. Box has smooth inside surface, and rounded corners. There are two rigid center casters and one swivel caster at each end, arranged tilt style for any direction travel. *Nutting Truck & Caster Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 268

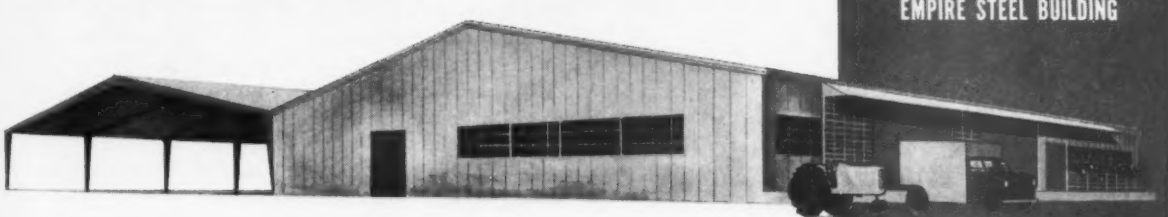
**ROLLER BEARING SERIES**
**...features patented cage design**

A new series of channel-shaped outer ring roller bearings features a new, patented cage design. Utilization of the cage design permits application of the bearings at speeds higher than those attainable with full complement types. Longer and larger rollers in these standard inch-size cage-type roller bearings result in greater capacities than heretofore available. Made in sizes ranging from ¾" to 4" bore, and designated as series HJ, the bearings may be applied directly to hardened and ground shafts or used with inner rings which are also available. *The Torrington Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 269


# WEATHER-PROOF EMPIRE DESIGNS PROTECT YOUR INVESTMENT

10% DOWN
BUILDS ANY WIDTH—
ANY HEIGHT—ANY LENGTH
EMPIRE STEEL BUILDING



**EMPIRE** has the answer for each and every storage need... sheds, warehouses and open storage shelters. Whether *your* problem centers around equipment or around materials, the 10 *exclusive* Empire extra-value construction features are important to *you*. Features like: three-year written guarantee against leakage–bonus interior space and die-formed panel sheeting. For more information on these features – and on how you can move into a new Empire steel building in days – phone or write today. Know your building costs before you buy!

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# Steam Line Problems?

SOLVE THEM WITH

**Aeroquip Flexible Hose of Teflon**

and Reusable "*super gem*"* Fittings*

Enthusiastic users say that Aeroquip 2802 Hose of Teflon and Reusable "***super gem***" Fittings are unmatched for steam line applications. They report long service even under constant flexing at 200 psi. (388°F.) of steam.

Aeroquip 2802 Hose of Teflon is chemically inert, has excellent lubricity, withstands 500°F. heat, making it ideal for chemicals, hot air, oils and solvents, too. Write for IEB-26B or call the Aeroquip Distributor near you for details.

*U.S. Patent Nos. 2,833,567 and 2,731,279.
"*super gem*" is an Aeroquip Trademark
Teflon is DuPont's trade name for its tetrafluoroethylene resin

Aeroquip

**AEROQUIP CORPORATION, WESTERN DIV., BURBANK, CALIF.**

**Aeroquip Northwest Warehouse, 635 N.W. 16th Ave., Portland, Ore.**

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

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# RIVETS and NAILS TO "AN" SPECIFICATIONS

**Immediate Delivery on Many Sizes**

**Air Force Approved Facilities**

Economically cold headed in MONEL
INCONEL • STAINLESS • COPPER • STEEL

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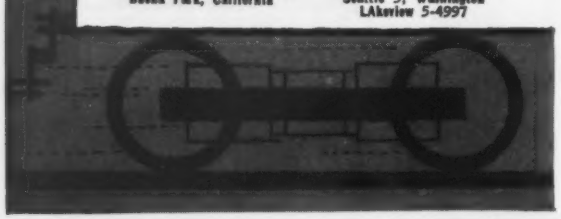


*. . . for more details, circle No. 39 on Reader Service Postcard*


**SUPERGLAS SAFETY HATS**
**. . . improved safety and weathering characteristics**

These new safety hats and caps have substantially improved safety and weathering (and abrasion) characteristics. The new safety feature is a single injection-molded polyethylene suspension unit with both a "fixed" safety factor with a 1¼" clearance from the crown of the hat or cap . . . and an additional "adjustable" clearance laced to fit the individual user. A further safety factor, as well as for weather and abrasion resistance, is the use of an added "veil" of fine-spun glass fibres placed near the outer surface of the shell. This results in a thin layer of resin and glass fibres close to the surface . . . increasing the life of the shell. *Fibre-Metal Products Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 270

**BARREL FINISHING CHIP**
**. . . fast cutdown, low micro-inch surface**

The new barrel finishing media designed for zinc die castings offers a rapid cutdown, thus lowering costs, and its fine-mesh abrasive produces a finish fine enough that hand buffing may be eliminated. Shaped like a truncated pyramid, the media's slough suspending chip action makes workpieces cleaner, and brighter. Its light weight assures freedom from impingement. The hand-buffed appearance that the media makes possible should allow zinc die casting previously not mass processed to be barrel finished. *Minnesota Mining and Mfg. Co.*

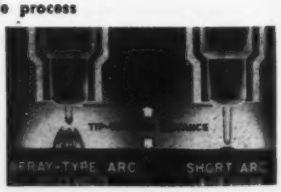
. . . FOR MORE DETAILS, CIRCLE NO. 271

**SHAFT-MOUNTED SPEED REDUCERS**
**. . . new 25:1 unit gives 40% lower output speed**

Greater strength and balance, despite same dimensions and horsepower ratings as old models, is evident in the new 25:1 reduction series of speed reducers. Both 15:1 and 25:1 gear ratios are available, with output speeds of 12-400 rpm, and the giant TD11 is described as the world's largest shaft-mounted speed reducer, with a reduction ratio of 24.73:1. The seven other sizes with torque arms come in 15:1 or 25:1 ratios along with three flange mounted reducers. *Dodge Manufacturing Corp.*

. . . FOR MORE DETAILS, CIRCLE NO 272

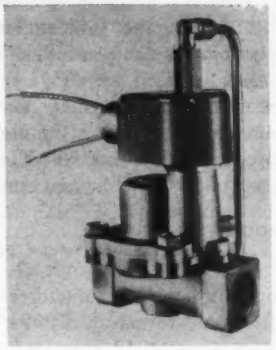
**SHORT-ARC WELDING**
**. . . inert-gas, consumable electrode process**




Outstanding feature of this new process is ability to make manual fusion welds in range of thickness of .030- to .100 in. of all common metals. It provides a more-readily-controllable process at high welding speeds, easier production of fillet welds, and ability to weld in all positions. A key factor in the method's success was development of both manual and mechanized equipment to feed wires as small as .020- or .030-in. in diameter. *Linde Co., Div. of Union Carbide Corp.*

. . . FOR MORE DETAILS, CIRCLE NO. 273

**TWO-WAY PACKLESS SOLENOID VALVE**
**. . . for handling steam, hot gases, light liquids up to 350 deg. F.**



Internally pilot operated with forged brass bodies and bonnets, these normally open solenoid valves have full pipe area orifices in ⅜, ½ and ¾-in. pipe sizes. They can be used to control flow of steam to turbine driven generators, as a tripping device on emergency power plants, where valve is required to open on power failure or when valve solenoid is de-energized. They are completely packless and mount in any position. *Automatic Switch Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 274

**DUAL-PURPOSE HYDRAULIC LIFT TABLE**
**. . . for die handling, sheet feeding operations**

A die pull-off and pull-on winch that folds down and away to provide an unobstructed top with conveyor rollers is a feature of this lift table. When the double drum hand winch is swung up and locked, the table is ready for use in pulling heavy dies off and onto press beds. The 20,000-lb. capacity table is portable, and has a tractor hitch. *West Bend Equipment Corp.*

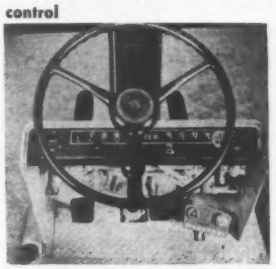
. . . FOR MORE DETAILS, CIRCLE NO. 275

**BATTERY-HYDRAULIC LIFT TRUCK**
**. . . low-cost, 1,000-lb. capacity model**

A machine specifically suited for handling appliances, boxes, drums and similar loads weighing up to 1,000 lb., this battery powered hydraulic fork and platform lift truck is said to be priced lower than any machine of its kind. Design features include 12-v. battery and self-contained charger; rugged construction, and complete bearing control throughout. *Big Joe Mfg. Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 276

**MONOTROL SYSTEM**
**. . . said to revolutionize lift truck control**



New concept in lift truck control and performance teams with the popular Power-Shift Hystamatic transmission. In the Monotrol system, throttle and forward-reverse direction control are combined in one right-foot pedal to free the operator's hands for full-time steering and load handling control. Dashboard push-buttons for "park" and "drive" govern an automatic parking brake and engagement of the automatic transmission. Other features of the system include a safety starting switch, which permits engine starting only if the "park" button is down, and a left-foot inching-brake pedal that allows the operator to control truck movement, yet keep his right foot on the throttle to maintain engine speed for fast lifting. *Hyster Company.*

. . . FOR MORE DETAILS, CIRCLE NO. 277

**STATUS CHANGING?**

If you are planning to buy, sell, incorporate or merge, you need a GENERAL APPRAISAL.

Whatever your business—technical . . . complicated—our professional appraisers provide a comprehensive, impartial valuation as the basis for an equitable transaction.

*Authoritative appraisal service since 1902*

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SPOKANE

*. . . for more details, circle No. 40*

**Oily and Wet conditions can be tough on conveyor belting**

TON TEX

**. . . but Ton-Tex OIL-EX belting makes the problem very easy!**

Unusual oily and wet conditions can slow up conveyor lines. Ton-Tex Oil-Ex conveyor belting will maintain the speed. Its plies of tightly woven duck are specially treated to resist acid, oil, grease, heat, steam, wet conditions, and severe abrasions and gouges. Automotive and metal working plants convey oily parts, assemblies, stampings and scrap metal on Oil-Ex. It lasts longer. Has minimum stretch and shrinkage. It is pliable and can be vulcanized endless. *Write today for 20-page Conveyor Belting catalog!*

Other TON-TEX belts for conveyor jobs

**STANDARD** for light, non-abrasive, grease-free products, cans, bottles, packages.

**HEAVY DUTY** to convey bulky, heavy products rapidly. Endures abrasions.

**PERMA-CLEAT** belts will carry products up steep inclines better and faster.

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.
1180 AUZERAIS AVENUE, SAN JOSE 26, CALIFORNIA

**TON-TEX** CONVEYOR AND TRANSMISSION **BELTING**

TON TEX

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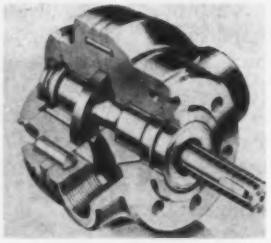
**NEW PUMP SERIES**
**. . . for use with fire-resistant fluids**



This line of Gerotor pumps, Series 800, for use with fire-resistant fluids has been life-tested on the job and accepted for preferred specification by some of the nation's leading companies. For use where fire hazards make use of hydraulic oils dangerous, as in die casting, welding, forging, etc., the pumps come in a variety of gpm. sizes. All are dimensionally interchangeable with the firm's oil-hydraulic units of comparable capacities and with most competitive pumps of that type. *Double A Products Co., subsidiary of Browne & Sharpe Mfg. Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 278

**HEAVY DUTY STRAPPING CUTTER**
**. . . a flat steel cutter for both strapping and strap removal**

With its strong, weight-reducing I-beam handles, this new cutter cuts strap up to 2x.050 in. quickly, easily and safely, reducing operator fatigue and speeding production. Toggle arrangement insures smooth overall cutting, and the top blade stays sharp longer due to the cutting angle. Jaw angle gives maximum cutting action with minimum effort and special-grip handles provide added cutting control. *A. J. Gerrard and Co.*

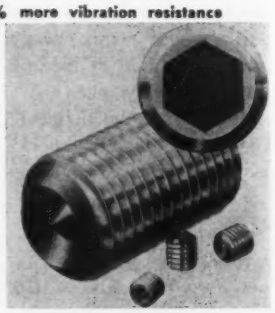
. . . FOR MORE DETAILS, CIRCLE NO. 279

**VERSATILE, HIGH-VACUUM FURNACE**
**. . . for brazing, heat treating problem metals**

Here is a versatile high-vacuum furnace for brazing and heat-treating the "problem" metals. The new facility makes possible greater protection from oxidation and embrittlement for such metals as titanium, beryllium, zirconium, molybdenum, tungsten, tantalum and columbium. The manufacturer reports the unit is unique for the size of the production, mockup and sample parts which can be handled under high-vacuum conditions. *Pyromet Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 280

**SOCKET SET SCREW**
**. . . 30% more backout torque, 50% more vibration resistance**

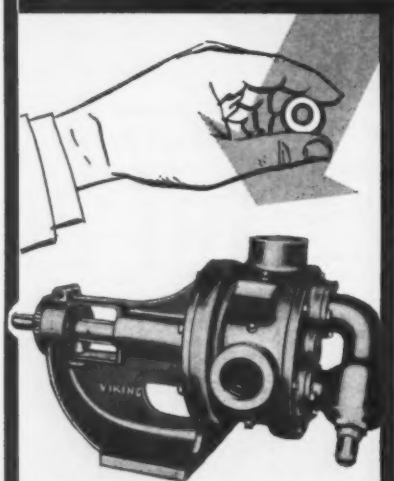


This new screw, developed by the manufacturer from an invention by its West Coast field representative, employs the revolutionary concept of a cone point centered within the screw's cup edge, to provide a high degree of holding power. Because the point makes contact with the engaged work before the cup edge, more backout torque, and resistance to slippage and vibration is achieved. The new screw is said to track evenly with a well-defined even groove. Its fixed point prevents oscillation of cup edge and minimizes tipping effect of key tightening. *Parker-Kalon Div., General American Transportation Corp.*

. . . FOR MORE DETAILS, CIRCLE NO. 281


*A New Concept in Pumping *Abrasive Liquids!*

**VIKING PUMPS WITH CERAMIC BEARINGS** AND MECHANICAL SEALS



After years of experimenting and testing, Viking has developed this new pump that assures you double to triple life, while pumping paints, inks and other *abrasive liquids. Among its features are special ceramic bearings and mechanical seals. Designed for heavy duty, these pumps handle liquids from a minimum viscosity of 100 S.S.U. to heaviest viscous types.

G.P.M. SIZES 3 - 6 - 12 - 16 - 25 - 40

**When writing for information, please give:**

- Liquid to be pumped
- Viscosity of liquid (S.S.U.)
- Percentage and type of solids present in liquid
- Temperature of liquid
- Specific gravity
- Capacity of pump
- Suction lift or head
- Discharge pressure

**And ask for Bulletin SP-507A**

*Consult factory for recommendations for pumping abrasive liquids other than paints and inks.

**VIKING PUMP CO.**

**Cedar Falls, Iowa, U.S.A.**

In Canada, it's "ROTO-KING" Pumps Pacific Coast Dist.: Viking Pump Co. of L. A., 4432 Long Beach Ave., L. A., Calif.; De Laval Pacific Co., 201 E. Millbrae Ave., Millbrae, Calif.

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**BLAST CLEANING BARREL**
**. . . for cleaning castings up to 500 lb.**

The 15-cu. ft. Rotoblast barrel is designed to provide the first heavy-duty type barrel of medium size to clean large castings weighing up to 500 lb each. It will handle a batch load of 2700 lb. Available with standard controls or in semi- or completely automated types, the unit incorporates a 30-hp. wheel which delivers 50,000 lb. of abrasive per hour for rapid cleaning at low cost. The interior construction features "wear resist" steel plates as standard equipment. This long wearing super-tough alloy lasts up to 100 times longer than mild steel and insures low maintenance costs. *Pangborn Corp.*

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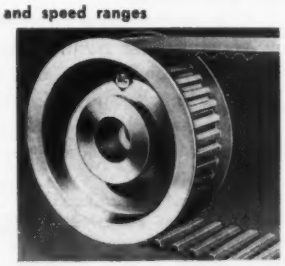
**TIMING BELT DRIVE**
**. . . versatile in application, load and speed ranges**



Highly versatile in application, load range and speed range, the new Time-Tex timing belt drive combines advantages of ordinary "Texrope" drives with those of chain and gear drives without slip, metal to metal contact, stretch and lubrication. Suitable for a wide range of load applications —from sub-fractional to 600 hp. with a torque load range from thousands of ft./lbs. down to light loads in in./oz. The drive makes possible a range of speeds from 0 to over 16,000 ft. per min. Because the drives do not depend on friction, there is no need for high initial tensions. Small pulleys, short centers, narrow belts, and high capacities are all space-saving features. *Allis-Chalmers Manufacturing Co.*

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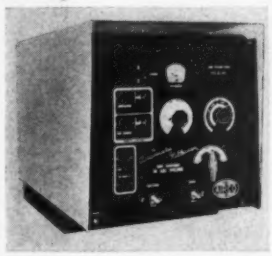
**RECTIFIER-TYPE WELDER**
**. . . features stepless adjustment of arc length**



Tested features of a rising characteristic power source with advantages of transformer-rectifier design are combined in this new rectifier-type Aircomatic® Fillerarc® DC welder. Specifically geared for use with Aircomatic welding applications, it's designed to supplement the company's line of motor-generator type machines. Suitable for both manual and automatic welding, its primary advantage is stepless adjustment of arc length and rate of rise for various wire diameters. The unit is rated at 450 amp. d-c., 40 volts, 100% of duty cycle. *Air Reduction Pacific Co.*

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**RIBBER-TIRED TRACTOR SHOVEL**
**. . . four wheel drive, 5000-lb. capacity**

More power for both hydraulics and traction, more efficient torque-converter; power shift transmission, pry-out bucket action, safety boom arms and power brakes and steering are among design advantages for this tractor shovel Model H-50 that will replace the Model HU Payloader. New, more powerful gasoline and diesel engines provide from 90 to 92 hp. *The Frank G. Hough Co.*

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RIDGID Thread Cutting Oils are available in convenient (4 ounce Nu-Clear only), 1 quart, 1 gallon, (2 gallon Nu-Clear only), 5 gallon, 30 gallon and 55 gallon containers.

Tests prove RIDGID® Thread Cutting Oil gives you better threads faster... lengthens die life, too!

Recently a distributor in Atlanta, Georgia investigated a complaint of "bad pipe". Test threads were made in all sizes. Torn threads resulted. Then RIDGID Nu-Clear Thread Cutting Oil was substituted for the oil being used. Perfect threads were obtained every time.

Here, then, is dramatic proof that you need a special purpose thread cutting oil . . . an oil that *cools, speeds metal removal, produces a smooth finish,* and *prevents chips from welding to your dies.*

No oil—in its pure state—will perform all these functions. That's why RIDGID Thread Cutting Oils are an exclusive, exactly formulated combination of oils, blended for easier, faster threading . . . longer die life. What's more, these special-purpose RIDGID oils are completely antiseptic . . . no danger of irritation or infection.

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**ANTI-SEIZE SEALANT**
**. . . for extremely high temperatures, pressures**

You can stop leaks from large diameter thread and coarse fittings . . . and in welded flanges that have become oval or distorted, by using this new anti-seize sealing compound. It works well at extremely high temperatures (—350 deg. to plus 2987 deg. F.) and pressures (50,000 psi hydraulic). *Armite Laboratories.*

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**POWERED INDUSTRIAL WHEELBARROW**
**. . . features an all new drive**

This powered wheelbarrow with improved controls features an all new drive engineered for industrial use. The combination transmission, differential and drive axle assembly is completely enclosed in one housing and is lubricated from one reservoir of oil. The transmission is full torque shifting, constant mesh, with instant shift from forward to reverse. The wheelbarrow has ¾ ton capacity. *The Prime-Mover Co.*

. . . FOR MORE DETAILS, CIRCLE NO. 287

**WALL CHART OF CONVERSION FACTORS**
**. . . reference table for engineers, shop men**

This reference table includes common conversions such as inches to centimeters and watts to horsepower as well as many conversions difficult to locate in reference manuals . . . such as atmospheres to Kgs. sq. cm, cm/sec to miles/hr, cu. ft. to liters, microns to meters, quintal to lbs.). *Precision Equipment Co.*

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**DRY BOX GLOVES**
**. . . for protection against radioactive materials**

A natural for positive manipulation of delicate, hard-to-handle atomic materials, these dry box gloves are made to user's specifications, in rubber, neoprene or the firm's Sureseal material. Complete flexibility and outstanding suppleness are provided. *The Surety Rubber Co.*

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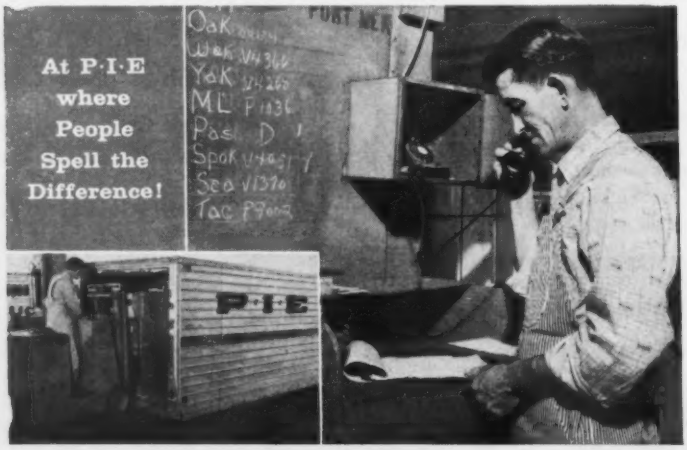


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Some companies point with pride to their long years of experience. Perhaps they believe that age alone is a compelling reason for customers to choose their product.

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How do you stay on top? The answer is you work at it, year after year. You study field reports, correct mistakes, make design improvements as you go along, explore new ideas, develop new products, testing and retesting them under every imaginable condition until you *know* they work. Result? Harnischfeger has led the way in crane and hoist design with the really big "firsts" — Magnetorque, Electronic Stepless Control, RCD hoist brake, Balanced Design Hevi-Lift hoists, just to name a few of the most recent.

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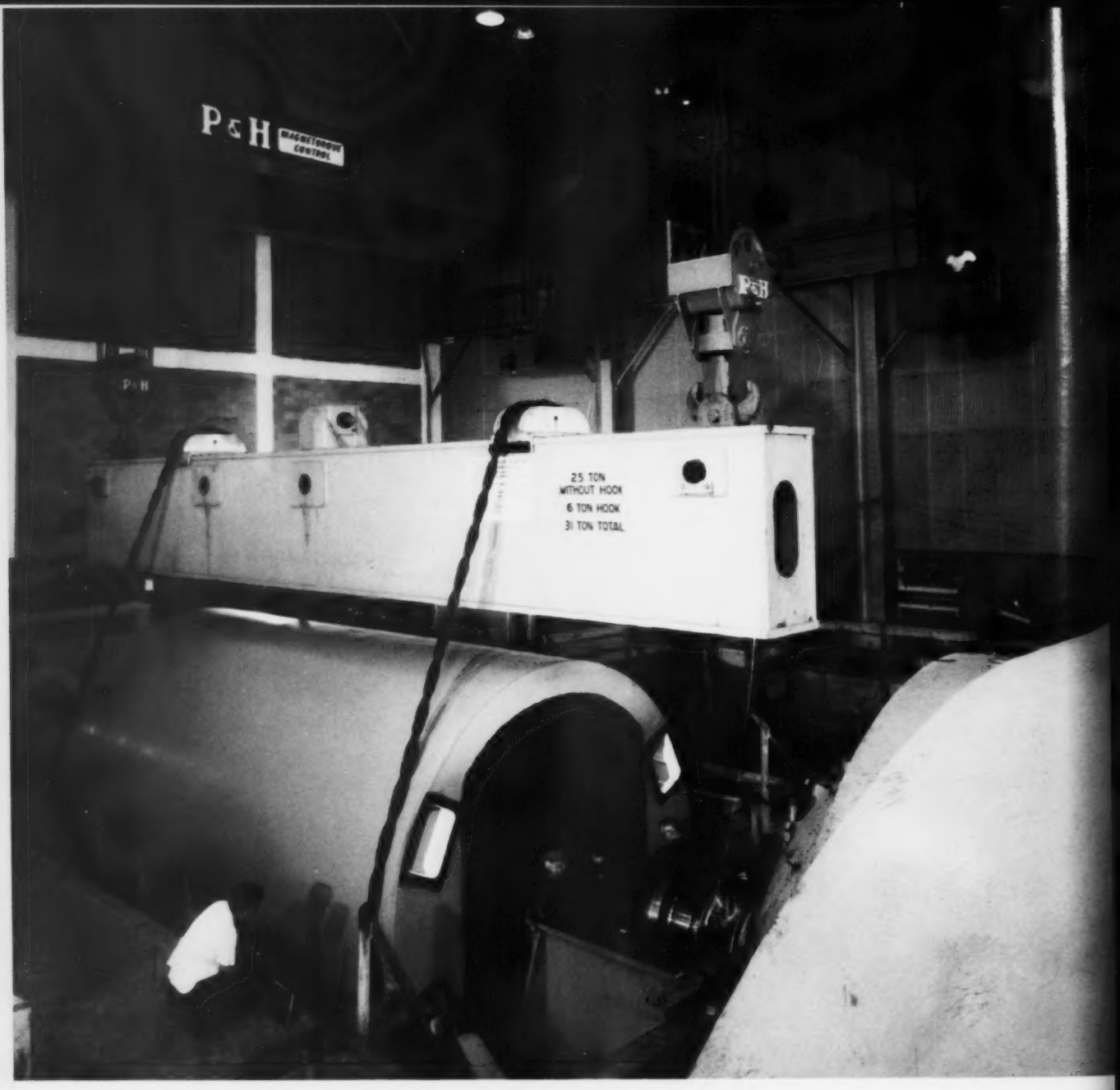


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| 4 | 31 | 58 | 85 | 112 | 139 | 166 | 193 | 220 | 247 | 274 | 301 | 328 |
| 5 | 32 | 59 | 86 | 113 | 140 | 167 | 194 | 221 | 248 | 275 | 302 | 329 |
| 6 | 33 | 60 | 87 | 114 | 141 | 168 | 195 | 222 | 249 | 276 | 303 | 330 |
| 7 | 34 | 61 | 88 | 115 | 142 | 169 | 196 | 223 | 250 | 277 | 304 | 331 |
| 8 | 35 | 62 | 89 | 116 | 143 | 170 | 197 | 224 | 251 | 278 | 305 | 332 |
| 9 | 36 | 63 | 90 | 117 | 144 | 171 | 198 | 225 | 252 | 279 | 306 | 333 |
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| 12 | 39 | 66 | 93 | 120 | 147 | 174 | 201 | 228 | 255 | 282 | 309 | 336 |
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| 14 | 41 | 68 | 95 | 122 | 149 | 176 | 203 | 230 | 257 | 284 | 311 | 338 |
| 15 | 42 | 69 | 96 | 123 | 150 | 177 | 204 | 231 | 258 | 285 | 312 | 339 |
| 16 | 43 | 70 | 97 | 124 | 151 | 178 | 205 | 232 | 259 | 286 | 313 | 340 |
| 17 | 44 | 71 | 98 | 125 | 152 | 179 | 206 | 233 | 260 | 287 | 314 | 341 |
| 18 | 45 | 72 | 99 | 126 | 153 | 180 | 207 | 234 | 261 | 288 | 315 | 342 |
| 19 | 46 | 73 | 100 | 127 | 154 | 181 | 208 | 235 | 262 | 289 | 316 | 343 |
| 20 | 47 | 74 | 101 | 128 | 155 | 182 | 209 | 236 | 263 | 290 | 317 | 344 |
| 21 | 48 | 75 | 102 | 129 | 156 | 183 | 210 | 237 | 264 | 291 | 318 | 345 |
| 22 | 49 | 76 | 103 | 130 | 157 | 184 | 211 | 238 | 265 | 292 | 319 | 346 |
| 23 | 50 | 77 | 104 | 131 | 158 | 185 | 212 | 239 | 266 | 293 | 320 | 347 |
| 24 | 51 | 78 | 105 | 132 | 159 | 186 | 213 | 240 | 267 | 294 | 321 | 348 |
| 25 | 52 | 79 | 106 | 133 | 160 | 187 | 214 | 241 | 268 | 295 | 322 | 349 |
| 26 | 53 | 80 | 107 | 134 | 161 | 188 | 215 | 242 | 269 | 296 | 323 | 350 |
| 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 | 297 | 324 | 351 |

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| 3 | 30 | 57 | 84 | 111 | 138 | 165 | 192 | 219 | 246 | 273 | 300 | 327 |
| 4 | 31 | 58 | 85 | 112 | 139 | 166 | 193 | 220 | 247 | 274 | 301 | 328 |
| 5 | 32 | 59 | 86 | 113 | 140 | 167 | 194 | 221 | 248 | 275 | 302 | 329 |
| 6 | 33 | 60 | 87 | 114 | 141 | 168 | 195 | 222 | 249 | 276 | 303 | 330 |
| 7 | 34 | 61 | 88 | 115 | 142 | 169 | 196 | 223 | 250 | 277 | 304 | 331 |
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| 15 | 42 | 69 | 96 | 123 | 150 | 177 | 204 | 231 | 258 | 285 | 312 | 339 |
| 16 | 43 | 70 | 97 | 124 | 151 | 178 | 205 | 232 | 259 | 286 | 313 | 340 |
| 17 | 44 | 71 | 98 | 125 | 152 | 179 | 206 | 233 | 260 | 287 | 314 | 341 |
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| 22 | 49 | 76 | 103 | 130 | 157 | 184 | 211 | 238 | 265 | 292 | 319 | 346 |
| 23 | 50 | 77 | 104 | 131 | 158 | 185 | 212 | 239 | 266 | 293 | 320 | 347 |
| 24 | 51 | 78 | 105 | 132 | 159 | 186 | 213 | 240 | 267 | 294 | 321 | 348 |
| 25 | 52 | 79 | 106 | 133 | 160 | 187 | 214 | 241 | 268 | 295 | 322 | 349 |
| 26 | 53 | 80 | 107 | 134 | 161 | 188 | 215 | 242 | 269 | 296 | 323 | 350 |
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# WESTERN INDUSTRY NEWS

THE INDUSTRIAL WEST . . . ON IT'S WAY

PLANTS • PRODUCTION • DISTRIBUTION • PERSONNEL

## Colgate-Palmolive Starts Big East Bay Expansion

BERKELEY, CALIF.—A multi-million-dollar expansion for its Western manufacturing headquarters here has been started by Colgate-Palmolive Co. Biggest construction program ever undertaken at its East Bay plant, the project calls for a 120,000-sq. ft. warehouse, a five-story annex to the present manufacturing and office building, and a new export loading facility.

When the construction program is completed in mid-1960, the present building will be demolished to provide a huge employees' parking lot.

All household products' storage and shipping operations will be consolidated in the new two-story structure. Conveyor "bridges" will carry products from production centers to the new warehouse where another conveyor network will route cases to special pallet loaders and thence to pallet elevators.

### *Riverside Cement May Build $5,000,000 Facility*

RIVERSIDE, CALIF. — Riverside Cement Co. has revealed plans for possible construction of a $5,000,000 plant to be built adjacent to its existing plant north of Rubidoux.

The cement firm has recently remodeled its packing plant, which features a device that automatically loads sacks of cement on skids or pallets for pick-up by a fork lift truck.

The proposed new plant for manufacture of "white cement" will produce the type used for cementing tile in bathrooms and for similar purposes.

### Windman Brothers Plan Phoenix Plastics Facility

PHOENIX — A Los Angeles plastics firm, Windman Brothers, of 3325 Union Pacific Ave., is opening a custom molding plant at 1423 S. 28th St. The $250,000 facility will employ about 125 persons, and will have this state's largest injection molding equipment.

### Marquardt Division Plans $1,200,000 Pomona Facility

POMONA, CALIF.—Pomona Division of The Marquardt Corp. has revealed plans to build a $1,200,000 engineering and administration building at the corner of Garey and Central Avenue. Ground breaking for the 50,000-sq. ft. facility will take place this month, with completion scheduled for next summer.

The Pomona Division develops and produces system simulators and trainers, ground support and other systems and equipment.

## Food Machinery Firm Expands in Portland

PORTLAND—Monroe Food Machinery, Inc., will build a new $275,000 plant in the Milwaukie Industrial Park. The 35,000-sq. ft. building will house warehouse and service facilities for food machinery, refrigerating and air conditioning. It will also provide manufacturing space for paper milk bottles and plastic food containers.

The Monroe firm headquarters are currently at 1600 S. W. Harbor Dr. Branch operations are in Boise, Ida., and Salt Lake City, Utah.

### Fumaric Acid Plant Scheduled in Salt Lake

SALT LAKE CITY — Utah Resin Co., 2378 Andrew Ave., has announced plans to start up a 2,500,000-lb.-yearly fumaric acid plant soon.

With the new plant the company expects to increase its basic production of isophthalic type polyesters to 5,000,000 lb. annually.

### $500,000 Beryllium Plant Slated for Hayward, Calif.

HAYWARD, CALIF.—A 20-acre site has been purchased by Brush Beryllium Co., Cleveland, O., for construction of a $500,000 plant. The 25,000-sq. ft. facility will be located on Clawiter Road near Depot Road. Operations are scheduled to start by next April.

## $8,000,000 Biscuit Plant to be Built in Denver

DENVER — The Bowman Biscuit Co. has announced plans to build an $8,000,000 plant on a 42-acre tract at West 48th Ave. and Pecos St. Capacity of the 400,000-sq. ft. facility will be 100,000,000 lb. of cookies and crackers annually.

Scheduled for completion next March, the plant will be of staggered height, ranging from four stories at the receiving end to one-story and basement height in other sections.

## Aluminum Extrusion Plant Opens in California

WATSONVILLE, CALIF.—Northern California's first aluminum extrusion facility — a 20,000 sq. ft. plant — has been established here by Pacific Extrusions, Inc. an affiliate of Aluminum Extrusions, Inc., Charlotte, Mich.

Located on a five-acre tract at Beach and Judd Roads, the new plant will produce a variety of extruded shapes to serve in many industries using items such as window, door and shower stall frames, hardware, lighting fixtures and structural members.

### Cody, Wyo., to Get Gypsum Board Facility

CODY, WYO. — A $3,000,000 gypsum board plant will be built on a 126-acre tract here by Big Horn Basin Gypsum Co., according to *Sid H. Eliason*, president.

The facility, to be completed in 1960, will have a yearly capacity of 100,000,000 feet of gypsum board. About 125 persons will be employed at the plant.

### Lodi Iron Works Expands

LODI, CALIF. — A 17,000-sq. ft. addition to its present plant is planned by Lodi Iron Works, Inc. New foundry machinery will be installed and employment will be increased by one-third.

## Jorgensen to Open Steel Warehouse in Hawaii

HONOLULU — Hawaiian industry will soon have an immediately available supply of all types of steel and aluminum with the opening of complete service center here by the Earle M. Jorgensen Co., major Western steel distributor. The new facility, representing an initial investment of over $1,000,000, will be built on a two-acre site at Lagoon Commercial Industrial Park, adjacent to Honolulu International Airport.

The 50,000 sq. ft. office-warehouse facility is scheduled to be in operation early next year. The firm has for many years shipped material to the Islands' metal users from its mainland plants, located in California, Texas, Oklahoma, Kansas, Colorado, Arizona and Washington.

The Honolulu plant will be the thirteenth service center for the firm. Like the others, its facilities will include modern sawing, shearing and flame cutting equipment.

Stocks will consist of carbon, alloy, stainless, tool and specialty steels in a complete range of sizes and analyses. Aluminum sheet, plate, rod, bar and extrusion, produced by Kaiser Aluminum, will also be stocked.

## *Colorado Mill & Lumber Co. Will Double Production*

ENGLEWOOD, COLO.—Doubled production capacity is planned for the Colorado Mill & Lumber Co., following purchase of the firm by Hallack & Howard Lumber Co. of Denver. Present yearly output of the plant at 3995 S. Clay St. is 6,000,000 board feet.

The firm will operate under the same corporate name as an H & H subsidiary, with *A. B. Ballah, Jr.*, previous owner, as general manager.

The Englewood firm purchases timber from the U. S. Forest Service and rough, green material from independent sawmill operators. The plant is a final manufacturing yard where raw lumber is converted into seasoned boards and surfaced to specifications.

## Stauffer and Victor Chemical Firms Merge

SAN FRANCISCO—A merger of Victor Chemical Works, Chicago, into Stauffer Chemical Co. was approved recently. Victor, a large producer of elemental phosphorous and phosphor-based compounds, will be operated as a division of Stauffer.

## Hockwald Co. to Build Plant In Crocker Industrial Park

SAN FRANCISCO—Hockwald Co., 135 Mississippi St., has announced plans for a new office, plant and warehouse in the 250-acre Crocker Industrial Park in nearby San Mateo county. The new facility on a 3½-acre site will provide some 65,000 sq. ft. of floor space.

A 60-year old firm, Hockwald is a processor and distributor of janitorial and sanitation supplies, headed by *Lionel Hockwald, Sigmund S. Hockwald* and *Harold A. Berliner.*

## *W. P. Fuller Enlarges Division in Northwest*

SAN FRANCISCO—As part of its continuing expansion program, W. P. Fuller & Co. has enlarged its Northwest region of Washington and Oregon to include Montana, Idaho and Utah, formerly in the firm's Intermountain region.

The consolidation plans also call for central warehousing and distribution, and centralized electronic accounting for the area. Expansion of the branch and dealer sales outlets system will also take place.

General manager of the enlarged Northern Region is *Paul G. Loynd*, who has been in the same position at Salt Lake City for the last three years. He joined the paint and glass firm in 1923 and has held various key posts at Fuller's many Western locations.

## Peerless Electric Becomes Division of H. K. Porter

PITTSBURGH, PA.—H. K. Porter Company, Inc., last month acquired Peerless Electric Co. of Warren, O., manufacturer of electric motors and fans, blowers and ventilating equipment. Both firms have numerous facilities in the West.

Peerless becomes the fourteenth division of the diversified Porter corporation, which plans further expansion of the firm into manufacture of air moving equipment and electric motors requiring special design and manufacture. *S. C. Powers*, who has been president of Peerless, will continue as the division's general manager.

## Paint Co. in Upland

UPLAND, CALIF.—Pactra Paint Co. of Ontario plans construction of a $175,000 factory and office building here. The 35,000-sq. ft. facility will be built on a 4½-acre site at 420 S. 11th St.

## Freightliner Reveals Two-Part Expansion Plan

PORTLAND—An expansion of its facilities here and construction of a new plant in Pomona, Calif., have been announced by Freightliner Corp., manufacturer of White-Freightliner trucks and tractors. The two-fold project will more than double production capacity of the Portland firm, a subsidiary of Consolidated Freightways.

Addition of the Pomona plant will provide custom-engineered and built highway transports for the Southwest highway truck market, according to *Kenneth W. Self*, recently advanced to president of the firm. *Edward G. Bartlow* has been named general manager for the California operation, which will be a 47,000-sq. factory on a 10-acre site on Franklin Avenue near the Southern Pacific spur track.

The Portland project includes a newly completed building to house the chassis and parts paint department and other operations. A 6,000-sq. ft additional building is also planned.

## Flintkote Plans Expansion for Calaveras Cement

SAN FRANCISCO—A major expansion of Calaveras Cement Co. is planned by the Flintkote Co., following its recent acquisition of the firm. According to *George J. Pecara*, president, a new Calaveras plant in Northern California is scheduled, as well as a Northern California location for the firm's Los Angeles Blue Diamond gypsum operation.

Flintkote, previously a one-product concern, has absorbed 11 companies during the last three years. It is now one of the country's most diversified producers of building materials, with plans for still further acquisitions.

## *Georgia Pacific Buys Utah Plywood Company*

SALT LAKE CITY—*Simon Frank*, owner of Davidson Plywood Co. of Utah, has announced sale of the distribution and warehouse firm to Georgia Pacific Plywood Corp., Portland, Ore.

*Andrew Durkee*, manager of Davidson, will represent Georgia Pacific in the Intermountain area. The Davidson name will be dropped and operations will be as Georgia Pacific.

The firm distributes plywood and other products in Western states.

## Missile Firm Acquisition

LOS ANGELES—Missile Systems Corp. of Los Angeles has acquired The Engineering and Manufacturing Corp. of Texas, manufacturer of food handling equipment for airlines, precision cases and cabinets, and other products.

## Continental Can Expands in Merced, Los Angeles

MERCED, CALIF.—A Western expansion program underway by Continental Can Co. calls for a new $1,500,000 metal plant here and a new building in Los Angeles that will double production capacity of its corrugated box plant.

Ground was broken recently for the metal plant, third plant for Continental in California's Central Valley. The facility, scheduled to start operations next May, will be about 100,000 sq. ft. Initial production capacity will be 100,000,000 cans annually. Original employment is expected to be about 35, with a future potential of 200.

In Los Angeles the firm has leased a 213,000-sq. ft. building at 6400 E. Washington Blvd., which will be equipped with a Langston combiner that will produce a continuous sheet of 85-in.-wide corrugated paperboard at a rate of 10,000,000 sq. ft. a week on a two-shift basis. The new plant will be in full operation next March.

### Microdot Reverses Trend In Westinghouse Purchase

SOUTH PASADENA, CALIF.—In a reverse of the usual trend, a small firm—Microdot Inc., 220 Pasadena Ave.—has acquired a branch of a larger corporation. Microdot, manufacturer of micro-miniature coaxial connectors and cables, has purchased the Los Angeles branch of the specialty transformer division of Westinghouse Corp.

First venture of Microdot into the transformer field and its first step in expanding its line, the purchase calls for eventual increase of plant facilities. Presently the plant is located at 3627 Holdrege Ave., Los Angeles, which has enough space for a doubling of personnel. *Edward A. Helling*, general manager, and all other employees of the division, will remain under the new set-up.

Microdot has a cable manufacturing division at Elm City, N. C., and intends to add a similar division to its South Pasadena plant next year.

### Boise Cascade Plans Colorado Container Plant

BOISE, IDA.—Boise Cascade Corp. has announced it will build a plant to manufacture corrugated shipping containers in Jefferson County, Colo., between Denver and Golden.

*John B. Fery*, general manager of the corporation's paper division, said the plant will employ about 55 persons.

### Newark Site Chosen for New Bemis Bro. Bag Plant

NEWARK, CALIF. — A 17-acre site at Robertson Road and Cherry Ave. will be the location of a new manufacturing facility to be built early next year by Bemis Bro. Bag Co. of St. Louis. The 155,000-sq. ft. plant will replace the company's present one at 1000 Sansome Ave., San Francisco.

Designed to be one of the company's key production units in the West, the plant will produce multiwall, burlap, cotton, open-mesh and waterproof laminated-textile bags.

## Construction on Montana Plywood Plant Begins

MISSOULA, MONT. — Vancouver Plywood Co. has started construction of its $2,500,000 plywood plant that will have an initial production capacity of about 6,000,000 bd. ft. of ¾-in. plywood monthly.

Preliminary plans call for a 15,000-sq. ft. main building with U-shaped material flow, beginning with the lathe, to slice logs in continuous sheets, and ending with saws, sanders and presses that complete the process.

When the plant, largest in the state, is in operation next spring it will employ about 200, including those in the logging operations. The company has obtained commitments of timber, and logging will begin soon.

### Fairchild Semiconductor in $1,500,000 Expansion

MOUNTAIN VIEW, CALIF.—A Bay Area expansion program that includes 50,000 sq. ft. of additional space here and a new plant in Marin county has been launched by Fairchild Semiconductor Corp.

The $1,500,000 project of the electronic firm calls for a $750,000 addition to its Mountain View transistor plant. The Marin county plant, also a 50,000-sq.-ft. facility, marks the firm's entry into the production of diodes.

Employment at the local plant is now 750 and is expected to increase by 1000 by the end of next year, according to *Dr. Robert N. Noyce*, vice president and general manager. The Marin facility will employ about 250 persons by that time.

### Paper Plant Possible

NEWARK, CALIF.—Paper Manufacturing Corp. of Philadelphia may build a $250,000 paper products plant here. The firm is considering a site on Cherry Street between Mowry and Central Avenues for the facility to be built next year.

## Ziegler Steel Service Expands to Honolulu

HONOLULU — Ziegler Steel Service Corp. has announced the opening of a steel, aluminum, copper and building products warehouse here.

The new facility will stock American-made steel, aluminum and copper in sheet form, in addition to steel bars, structurals, plate, strip, reinforcing bar and welded wire mesh.

**HONOLULU WAREHOUSE PLANS** are being discussed by **Herbert Ziegler**, president (left), and **Lee H. Burke**, Honolulu Division manager for Ziegler Steel Service Corp.

For Hawaii's rapidly expanding construction industry, Ziegler will stock roof deck, grating, perforated and expanded metals. Plans have also been made to represent major steel building products manufacturers on windows, doors, metal lath accessories, joists, curtain wall and highway products.

### *Perkin-Elmer Opens Western Research Center*

LOS ANGELES—Perkin-Elmer Corp., a Norwalk, Conn., instrumentation firm, has opened a Western facility for advanced research and development at 5670 E. Washington Blvd.

Designed to serve defense and space industries in 11 Western states, the operation is located in a 15,000-sq. ft. plant. Initial plans call for a staff of about 100 engineers and other personnel within a year.

### Borden Plans Resin Plant in San Francisco Area

SAN FRANCISCO — The San Francisco Bay Area will be the location for a new resin and formaldehyde plant to be built by the Borden Chemical Co. Several sites are under study for the facility, which will be Borden's sixth manufacturing unit on the West Coast.

Construction is scheduled to begin by the end of the year. The plant will have a yearly capacity of 95,000,000 lb. Plans include a warehouse and office building.

GEARS FOR INDUSTRY
THE Lufkin LINE
OIL FIELD PUMPING UNITS

# THE FIZZLING FIFTIES

V. J. Fawcett

**A glance at the calendar reminds us that the clock is running out on the '50's. Anything but a fizzler tho', the 1950's brought us so many new achievements, and so many surprises, that it is bewildering to try and add up the score.**

In January of 1950, who ever heard of an ICBM (outside of an Eskimo), or a Sputnik, or the $64,000 Question, and it looks like that one will be heard from on into the sixties.

**And think of all the wonderful advances in the field of medicine, particularly the Salk vaccine.**

And in the field of finance, many changes have taken place—cash is almost obsolete—with a Diner's Credit Card you can buy anything from a Lufkin Unit to left handed flute. (NOTE: We are old fashioned—cash will do.)

**In sports this year, we've seen a virtual miracle—a Pacific Coast World Series championship, thanks to the Los Angeles Dodgers.**

• Lufkin, too, made a little history in the fifties by introducing the World's Largest Oilfield Pumping Unit at Tulsa. • And in 1950, Lufkin introduced an advanced line of Spiral Bevel Gears for Cooling Tower Fans. • Lufkin introduced the use of factory-packed prelubricated bearings, and nodular iron gears for oilfield use.

**A thought for the '60's—**

**If you drink, think.**
**or**
**If you think, don't.**
**or**
**Play safe—just lie there.**

Lufkin FOUNDRY & MACHINE COMPANY

*. . . for more details, circle No. 49*

# Linde Dedicates Multi-million Dollar Plant

THE SWITCH THAT officially placed Linde's new plant on stream in Pittsburg, Calif., was pulled by **Lt.-Gov. Glenn M. Anderson** of California. Looking on as the new liquid oxygen-nitrogen plant went into operation were (l. to r.) **P. J. Simmons,** Pacific Coast production manager, Linde Co.; **W. B. Nicholson,** president of Linde, and **J. Vincent Burke, Jr.,** General Counsel, Department of Defense.

PITTSBURGH, CALIF.—On October 22, Linde Company, division of Union Carbide Corp. dedicated a new multi-million dollar plant capable of producing some 300 tons daily of liquid oxygen, nitrogen and argon.

The plant, which was completed six weeks ahead of schedule, is the first one of its kind to be constructed completely outdoors. This is the second of a series of plants to be built in the West by Linde Co. under a program of Western expansion. Most of its output will be utilized by Western missile, chemical and steel industries.

## *Kingwell Quadruples Stock, Space in Los Angeles Move*

LOS ANGELES—Both space and stocks in Los Angeles have been quadrupled by Kingwell Bros., Ltd., with its recent move into a new office-warehouse facility at 4600 Pacific Blvd., according to *J. E. Nauman,* president of the San Francisco manufacturer and distributor of bronze bearings and bushings.

The new facility, under direction of *Walter Schumann,* serves the Southern California area with Kingwell bronze bearings, Asarcon continuous cast-bronze and Oilite bearings, plates and filters.

## November Completion Date for Ling-Altec Expansion

ANAHEIM, CALIF.—Scheduled for completion here late this month is a $600,000 expansion project for Ling-Altec Electronics, Inc., that will provide some 65,000 sq. ft. of plant space. The enlarged facility on the firm's property near Harbor Blvd. and the Santa Ana Freeway will include a new manufacturing building.

Total investment in the property will exceed $2,000,000. On completion the company will move its Culver City plant, which manufactures high power vibration test equipment and sonar components, to the 13-acre site.

Employment at the enlarged facility will be about 450, with an annual payroll of over $2,000,000.

## *Tektronix, Inc., Continues Expansion in Oregon*

PORTLAND — Most recent phase of the continuing expansion program for Tektronix, Inc., is construction of a new $225,000 factory and office building near Beaverton.

Part of the electronic firm's new building, which adjoins another of its facilities, will be leased to the Rodgers Organ Co., which manufactures transistorized organs and is now located at 10400 S. W. Canyon Road.

Tektronix, manufacturer of cathode ray oscilloscopes, is also building a million-dollar plant in the Beaverton area for producing ceramics components for its products.

## New MonoRail Distributor

DISTRIBUTION PLANS are being discussed here by Buehrer and MonoRail executives following the naming of E. C. Buehrer Associates, Inc., as Northern California distributor for American MonoRail. From left are **O. L. Jenkins,** president, and **A. C. Hamre,** vice president, of Buehrer, and **L. P. Helbert,** sales manager of American MonoRail Pacific Coast Division. The Oakland distributor, located at 253 Fourth St., will handle the Railmaster and standard lines of MonoRail systems and cranes, and products of the firm's conveyor division.

### Further Expansion Due for Maas-Hansen Steel

VENTURA, CALIF.—Latest phase of a long-range expansion program for Maas-Hansen Steel Corp. is addition of another warehousing bay to their facilities at 2435 E. 37th St.

The new 10,000-sq. ft. addition is being built for instant handling of aluminum materials and will be equipped with two 10,000-lb. capacity cranes, and a third with a 20,000-lb. rating.

Maas-Hansen also plans an expansion of service in both the ferrous and non-ferrous metals fields.

### More Northern California Outlets for Westinghouse

SAN FRANCISCO — Expanded distribution facilities in Northern California have been announced by Westinghouse Electric Corp., with the merger of Incandescent Supply Co. with Phillips & Edwards Electric Corp., presently representing Westinghouse. Under the agreement, all ten northern California operating companies included in the merger will handle Westinghouse industrial apparatus.

Plus present Bay Area locations, distributors are located at Sacramento, Redding, Fresno and San Jose.

### Portland Veneer Facility

PORTLAND — A new facility at SW Childs Road is being built by Conrad Veneers, Inc., to manufacture veneer and consolidate other operations. The $135,000 plant, covering about 25,000-sq. ft., will house manufacturing operations, dry kiln and offices.

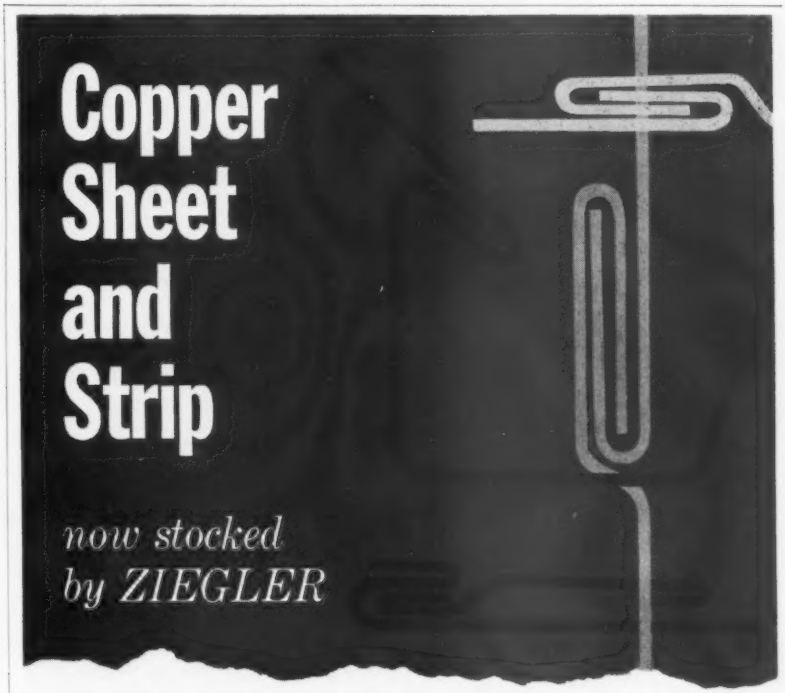
## *General Appraisal Co. Honors Long-Time Employe*

SAN FRANCISCO—*W. D. Trewartha* and five other members of the General Appraisal Co. were honored recently at a service awards banquet. Out of town directors of the firm, who have a combined total of 191 years employment with the company, took part in the ceremonies.

Trewartha, vice president and district manager, was honored for his 25 years service to General Appraisal Co. Others who received certificates for 15 to 30 years of service were *A. E. Ahlbert,* Seattle district manager; *R. C. Littell,* chief appraiser of the San Francisco office; *S. W. Gibson,* vice president and assistant manager in Los Angeles; *W. M. McCloy,* president, and *R. L. Lauer,* treasurer.

### Bay Area Industrial Site

SOUTH SAN FRANCISCO—A new industrial area currently under development is the Starlite Industrial Subdivision off Linden Ave., between El Camino Real and the downtown area here. Early plans call for construction of six small manufacturing and distributing plants on the 11-acre site.


A complete line of copper sheet as well as aluminum sheet is now stocked by Ziegler at *three* California warehouse centers — Los Angeles, North Hollywood and Oakland.

This makes Ziegler the only REVERE statewide distributor of both aluminum and copper sheet and strip.

Ziegler's flat-rolled metal service is constantly widening – now includes hot rolled...cold rolled...galvanized...pickled and oiled ...tinned...sheet steel of every type, in a wide variety of analyses.

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**Oakland 21:** 727 – 66th Avenue · LOckhaven 2-2133
Enterprise 1-1037 for toll-free calls

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## Paper, Lumber Companies Merge, Map Expansion

LOS ANGELES — A consolidation of three California paper firms with Southwest Lumber Co. of Phoenix, major lumber producer, will result in three new facilities for the West.

The move involves Wilson Paper Co., 4200 S. Alameda St., Vernon Container Corp. 3063 Fruitland Ave., and Pioneer Wrapper Co. 2041 E. 25th St., all of Los Angeles. *A. J. Wilson* heads all three and will continue in that capacity under the consolidation agreement.

Combined floor space of the firms is about 200,000 sq. ft. Products include corrugated and folding cartons and gift wrapping paper.

Southwest Lumber has large timber reserves in Arizona and mills in McNary and Flagstaff, Ariz., and Corrigan, Tex.

Expansion plans call for construction of a kraft paper mill at Snowflake, Ariz., to start next spring; a corrugated converting plant at Phoenix, to begin operations about the first of the year, and a Los Angeles corrugating plant, also scheduled for operation early in 1960.

### Construction Under Way on NW Chemical Facility

PORTLAND—Pacific Carbide & Alloys Co. has started construction on its $500,000 chemical plant that is expected to produce 5,000,000 lb. of vinyl acetate yearly.

The facility, to be completed in March, is being erected on a one-acre site at N. Columbia Blvd. and Hurst Ave. Vinyl acetate is an intermediate chemical product widely used in making adhesives, plastics, synthetic fabrics and paint.

### Weyerhaeuser Will Double Plywood Plant Capacity

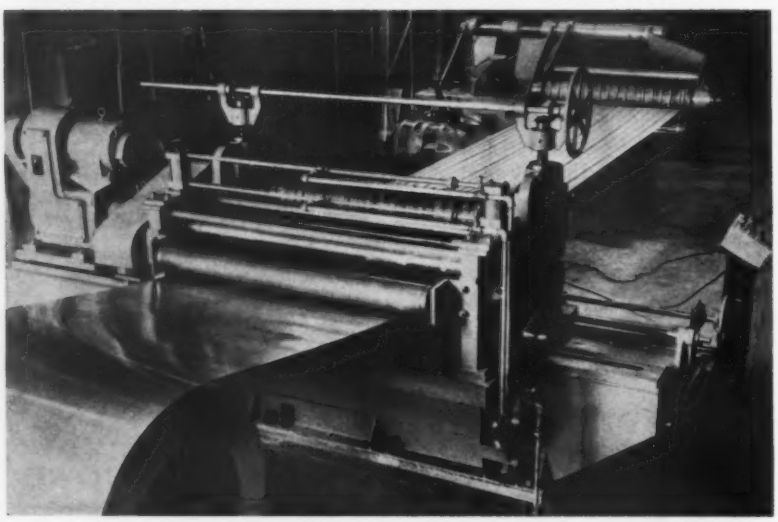
LONGVIEW, WASH.—An expansion that will nearly double present production capacity has been announced by the Weyerhaeuser Co. for its plywood plant here. The new facilities, scheduled to be in operation next summer, will be used for production of plywood panels from soft woods. Employment is expected to increase by about 160 persons with the new project.

### Gaylord To Open New Facility in Portland

PORTLAND—Asa Gaylord, inventor of Gaylord ventilator systems, has revealed plans to open a plant in the Multnomah area where he will manufacture an adaptation of his systems for home kitchen use.

He presently produces the automatic fire control device for the commercially-used systems in a plant at 7424 S. W. 25th Ave.

## Bralco Machine Slits Aluminum to Exact Width



EXACT WIDTH SPECIFICATIONS for aluminum coils are possible with installation of this new 48-in. slitter at Bralco Metals, Inc., Los Angeles, non-ferrous metals warehousing firm. As pictured in operation, aluminum from payoff coil (left foreground) passes through slitter unit (center). Precision honed blades slit metal into predetermined widths, which are taken up on the recoiler (right background). Specially designed to slit aluminum coils up to 10,000 lb. in weight, it will handle thicknesses ranging from .010 to .125 in all available tempers. The slitter is a combination power-driven or pull-through type, with special sensitivity at the slitter arbor mountings.

### Idaho Fertilizer Plant To Be $12,000,000 Project

KELLOGG, IDA.—The Bunker Hill Co., San Francisco, has announced that its new fertilizer plant development here will ultimately be a $12,000,000 project, according to *John D. Bradley*, president.

Construction on the plant's first unit, a phosphoric acid plant, will be started immediately. Kellogg was chosen over Kennewick, Wash., mainly because sulfuric acid, the basic ingredient in fertilizer production, was available here as a by-product of the firm's zinc plant.

### Flair Aviation Handles Reynolds Windows

LOS ANGELES—Flair Aviation Corp., formerly known as Fletcher Aviation, has been named a distributor for Reynolds commercial aluminum windows.

Located at 2300 Flair Blvd., El Monte, Calif., the distributing firm occupies a 122,000-sq. ft. building, which has complete production and metalworking facilities. Flair also is prepared to fabricate and erect custom aluminum curtain walls and their related products.

### Production of Mobile Homes Starts in Lamar, Colo.

LAMAR, COLO.—Production of mobile homes in the new $120,000 plant of the Midway Trailer Corp. here was scheduled to begin last month.

When fully operative, the factory, employing some 50 persons, is expected to produce about seven mobile homes per day, according to *Dale Whitbeck*, plant manager.

### Gardena Foundry Expands

GARDENA, CALIF. — Ellis and Vans' Foundry, Inc., has expanded its plant for aluminum and magnesium sand casting. Total area at its facility, 358 W. 168th St., is now about 15,000 sq. ft.

### Electric Fixtures Plant

SOUTH EL MONTE, CALIF.—De Lights, Inc., is building a new facility here for manufacture of fixtures and lamps. The $120,000 plant includes an 18,000-sq. ft. first floor, plus a 7,000-sq. ft. mezzanine section.

### Desmond Bros. Facility

TORRANCE, CALIF.—New facilities at 1526 W. 228th St. were occupied recently by Desmond Bros., manufacturers of Deft wood finish in plants here and in Alliance, Ohio.

## New Bay Area Warehouse for B. F. Goodrich Co.

SAN FRANCISCO—B. F. Goodrich Co. has revealed plans for a new 100,000 sq. ft. warehouse-office facility in Crocker Industrial Park. Increased warehouse capacity, modern handling equipment, and faster service for customers will be provided in the new location.

The four company divisions that will move from present quarters at 1950 Army St., here to the new center are B. F. Goodrich Tire Co., Industrial Products Co., Footwear & Flooring Co. and International B. F. Goodrich Co.

Construction on the new building is to start immediately, with occupancy scheduled for early next year. Location will be a five-acre tract just off Bay Shore boulevard on the South Edge of San Francisco.

About 8,000 sq. ft. will be used for sales offices, with the remaining 88,000 sq. ft. for warehousing of tires, industrial rubber products and foot wear.

## *Griffith Rubber Plans Expansion in Portland*

PORTLAND—Griffith Rubber Mills has announced an expansion of both facilities and personnel along with broadening of its product line resulting from license agreements with Pawling Rubber Corp., Pawling, N. Y. The Portland firm, located at 2439 NW 22nd Ave., will produce Pawling entrance mats and patented neoprene extrusions for use in curtain wall building construction.

Griffith produces rubber items for the paper industry, plus other industrial rubber moldings and extrusions.

## U. S. Engineering Holds Open House at New Plant

VAN NUYS, CALIF.—An open house and tour of the plant marked the recent completion of a new facility for U. S. Engineering Co., a division of Litton Industries. One of the country's most completely integrated plated circuit manufacturing facilities, the 24,0000-sq. ft. plant is located at 13536 Saticoy St.

Plant visitors saw machining and molding operations, the plating of electronic terminals and photographic processes during their tour. The new plant is one of several companies in the Components Group of Litton Industries.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**because it's more maneuverable**

***These features give low-cost bulk handling . . .***

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| 2,500 lbs. carry capacity | Only 6-foot turning radius | Power-shift transmission |
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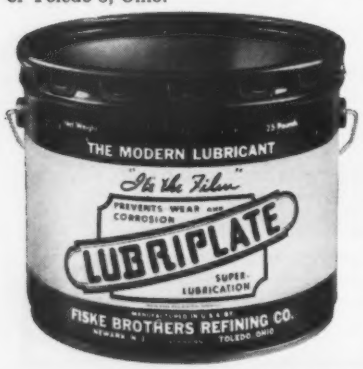


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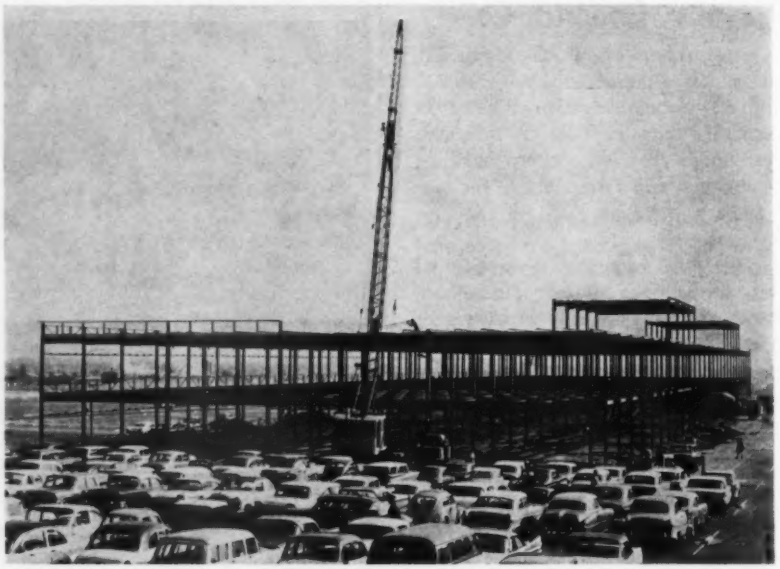
# Erection Timetable is Record-Breaker



CRANE LIFTS LAST PIECE of structural steel to top out new Hughes Aircraft structure near West Coyotes Hill section of Fullerton, Calif. Structure is 134 x 562 ft., was built in just 56 days, despite steel shortages.

FULLERTON, CALIF. — Despite steel shortages caused by the current strike, Vinnell Steel Co., Irwindale, Calif., claims a speed record in raising a new 150,000-sq. ft. two-story engineering facility for Hughes Aircraft Co. in Fullerton, Calif.

Vinnell says their 56-day erection timetable is a record breaker, with all 800 tons of structurals "in the air" for the new building.

Vinnell accomplished the complete steel fabrication and erection job in just 65 calendar days after receiving the contract award.

Second floor beams required more than 200 tons of 24-in., 100 lb. wide flange sections. Since they could not be purchased in "as rolled" condition, Vinnell Steel built the 89 required beams from plate in their bridge and girder shop.

The balance of steel requirements for the job, including three miles of 12-in. beam for main floor assembly and over two miles of 9-in. channel for roof members, came from Vinnell inventory or local steel service centers.

Three mobile cranes were pressed into service to lift over 100 tons of steel in the air each day. High tensile bolts were used to join structurals.

## Santa Fe Directors, Officers Tour West

LOS ANGELES—Board directors and other officers of the Santa Fe Railway recently made an inspection tour in the West, to meet business and civic leaders and to observe company facilities and operation.

Itinerary included Phoenix, San Diego and Los Angeles where tours of industrial areas and civic luncheons were planned. In Los Angeles the board held its regular monthly meeting Nov. 4.

## Seattle Firm to Handle Motorola Semiconductors

SEATTLE — Motorola Semiconductor Products Division has named C & G Radio Supply Co., 2221 Third Ave., as an industrial distributor. Sales of the division's semiconductor components will be handled in the state of Washington through C & G's five branch outlets in Tacoma, Bremerton, Olympia, Aberdeen and Centralia.

## Tamar, Pres-To-Line Start Building Program

LOS ANGELES—First phase of a million-dollar building program for Tamar Electronics, Inc. and Pres-To-Line Corp. of America is a plant under construction at 2045 Rosecrans Blvd., near Gardena, Calif.

The 50,000-sq. ft. plant on an 8½-acre tract is designed to have a rooftop heliport and extensive parking facilities.

Tamar is a supplier of airborne antenna transmission-line systems and components.

## *Carbon Dioxide Facility Being Built in Stockton*

STOCKTON, CALIF.—A $350,000 plant for conversion of carbon dioxide is under construction by Carbon Dioxide and Chemical Co. of Salt Lake City and Seattle. The new facility is adjacent to and under contract with the new $6,000,000 plant of California Ammonia Co. plant in the Lathrop area.

Daily production capacity of the plant will be about 40 tons of liquid carbon dioxide, a by-product of the manufacture of ammonia.

## Fiber Lab Formed by Hill and Higman, Washington Iron

SEATTLE — Washington Iron Works and Hill & Higman's pulp and paper division are sponsors of a new independent research laboratory to serve the pulp, paper and paperboard industries in the Northwest.

The research and development center is housed in a new building at 1500 Sixth Ave. S. Offices are at 3104 Western Ave.

Hill & Higman is a consulting engineering firm active in this area since 1890. Washington Iron Works, established here in 1882, is a major supplier of mechanized, mobile logging machines, as well as presses and other equipment for manufacture of plywood, hardboard, particle board and pulp.

Known as Fiber Research, the new venture is headed by *Edgar G. Putnam*, technical director.

## *Petersmith Controls, Inc. Organized in Bay Area*

SOUTH SAN FRANCISCO — Petersmith Controls, Inc., is a new Bay Area firm formed to engineer and manufacture labor-saving electrical and mechanical control systems for original equipment manufacturers, industrial plants and installation contractors. Special emphasis will be placed on material handling control.

Offices and plant of the new firm are at 350 Victory St. Present management personnel consists of *Richard W. Corey*, vice president and chief engineer, and *Robert T. LaPorte*, treasurer and production manager.

Corey was formerly chief engineer of Rundel Electric Co., Millbrae, and has designed several original automation systems for material handling and control. LaPorte for ten years was plant electrical engineer at the Fisher Body Division of General Motors in Oakland, and has extensive experience in mass production techniques, material handling and original automation procedures.

## Portland Die-Casting Firm to Double Capacity

PORTLAND—An expansion program to double its plant capacity is scheduled by Future Products Co., producer of die-cast parts and components for other industries. The project includes an additional 8,000 sq. ft. of plant space and installation of a 400-ton vacuum die casting machine, buffing and ball burnishing machines.

## *David Brown Appoints Distributor in Long Beach*

SAN LEANDRO, CALIF.—Bay City Bearing Co., Inc. 709 W. 16th St., Long Beach, has been appointed by David Brown, Inc., to handle Radicon speed reducers, complete drives and gearmotors in Los Angeles and Orange County. Plans calls for establishing a new facility near Anaheim soon.

The distributing firm is headed by *Walter R. Seidel. Rob Forslun*, David Brown factory sales engineer, works with Bay City staff members on training and sales.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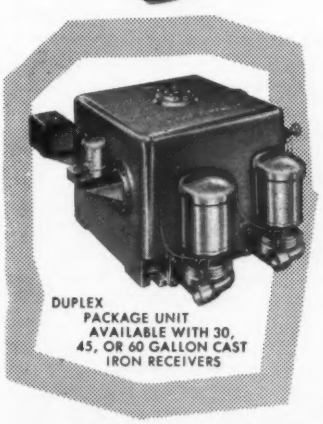


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## Grand Central Rocket Co. Maps Big Expansion

REDLAND, CALIF. — Grand Central Rocket Co. has announced a multi-million dollar expansion program that will enlarge plant facilities and substantially increase employment.

An engineering building, administration building and a new propellant research laboratory for a program that will cost more than $2,000,000 are included in the project. The growth program may eventually double or triple the present payroll of 600 persons, it was indicated.

The company makes propellant for the third-stage rockets in the Vanguard space missile and is engaged in other activities relating to the missile industry.

### Gas Controls Company Formed in Butte, Mont.

BUTTE, MONT. — Butte Brass Co., a new firm, has been established here for manufacture of gas controls, brass valves and fittings in conjunction with the control division of Sullivan Valve & Engineering Co.

The brass company will have its plant in a building which adjoins that of the parent company at 917 Oregon. The manufacturing facility will be the first of its kind in the Northwest, according to *Tim J. Sullivan*, board chairman of the Sullivan firm. Initial employment will be between 50 and 100 persons.

### Husky Oil of Cody, Wyo. Buys Briquetting Firm

CODY, WYO.—*Glenn E. Nielson*, president of Husky Oil Co. here, has announced purchase of the Dickinson Briquetting Co., Dickinson, N. D., and installation of special equipment for manufacturing barbecue briquettes from lignite. Production of industrial briquettes will be continued.

### Push-Button Feed Mill

PORTLAND—Construction of a feed mill for the Western Farmers Association was begun recently on a 10-acre Mocks Bottom site here. Designed for push-button operation, the facility will cost about $1,500,000.

### Townsend's Rivet Division Has New Facilities

SANTA ANA, CALIF.—Cherry Rivet Division of Townsend Co. has established new manufacturing facilities for commercial fasteners and cold formed parts by moving its commercial products department to 805 S. McClay St.

According to *F. C. Fearman*, plant manager, new machines and additional equipment at the new location will be able to provide Western manufacturers with a broadened product line including products and specialties in the impact and extrusion fields.

Technical aid is also available to users from the enlarged staff at the Commercial Products department, with *P. W. Stewart* as superintendent.

### Litton Unit Expands

VENICE, CALIF.—Expansion plans for Triad Transformer Corp., a division of Litton Industries, include a total of 10,000-sq. ft. for jobber sales offices and epoxy molding and research departments.

## Contract News for the West

LOS ANGELES—A prediction that 1960 will bring to Southern California industries nearly $25,000,000 more in army ordnance business than 1959 was made recently by *Col. P. H. Scordas*, chief of the Los Angeles army ordnance district. This increase will be mainly due to awards in the army missile field, he said, in forecasting a $400,000,000 total for fiscal 1960 as compared with $376,000,000 for 1959.

Recently the district announced the award of over $3,500,000 in new business. Among the contractors are:

*General Electric Co.*, Phoenix, Ariz., $2,067,138 contract for digital computation facility operation at the U. S. Army Ballistic Missile Agency, Redstone Arsenal, Ala.; *Douglas Aircraft Co., Inc.*, Santa Monica, a $326,958 contract for Nike Hercules launching area items; *Rocketdyne Div., North American Aviation*, a $304,000 classified contract; *Harvey Aluminum, Inc.*, a $251,808 R & D contract;

*Aerojet-General Corp.*, a $130,357 supply contract and a $92,682 contract for activation and operation of launching equipment; *Associated Aero Science Laboratories, Inc.*, a $92,977 contract for technical services; *Plasmadyne Corp.*, a $84,979 R & D contract regarding plasma propulsors.

From the San Francisco Ordnance district a report about the first quarter of fiscal 1960 reveals that 21 Bay Area firms are among 24 companies and research centers to share in $4,300,000 worth of new defense business.

Military and government contract news recently reported to WESTERN INDUSTRY also includes:

The *Electro Mechanical Instrument Div.*, Consolidated Electrodynamics Corp., a $352,800 FAA contract for oscillographs; *Puget Sound Bridge and Drydock Co.* and *Johnson, Drake and Pipe, Inc.*, a shared contract, for fiscal 1960, for $2,135,000 for operation and maintenance of the Dewline supply depot, Point Barrow, Alaska; *Sierra-Schroeder Controls Div., Idaho Maryland Mines*, $650,000 for motor-operated valves for the B-52 jet bomber;

*Summers Gyroscope*, orders over $1,000,000 for "Free" gyros for use in the LaCrosse missile; *Farmers Tool & Supply Co.*, of Denver, $853,112 for air-driven gyroscopes, known as Rolleron assembly units to help stabilize missiles in flight; *Solar Aircraft*, over $1,500,000 for its Mars, Jupiter and Saturn gas turbine engines; *Telecomputing Corp.*, $1,608,000, for gyro systems for the Nike-Hercules missile; *The Siegler Corp.'s Hufford Div.*, over $500,000 from *Lockheed* for a space age machine tool, the Spin Forge, which will be the largest of its type in the world;

*Servomechanisims, Inc.*, additional follow-on order for $416,280 for True Airspeed computers, and $217,625 for magnetic amplifiers and transformers; *Royal Industries, Inc.*, over $400,000 for B-52 wing flapball screw actuators; *Electronic Engineering Co.* of Calif., $358,000 for range instrumentation work at the NAFEC in Atlantic City, N. J.; *Blackwelder Manufacturing Co.*, a $150,000 contract to produce baggage cart assemblies for United Airlines;

Other contract news deals with *Northrop Corporation's Norair Division*, an air force contract for 50 additional T-38A Talon supersonic jet trainers; *Nortronics Div. of Northrop*, selection as a subcontractor for the guidance sub-system for the GAM-87A launched ballistic missile for which *Douglas Aircraft* is prime contractor; *Monogram Precision Industries*, three prototype contracts for a food galley serving and storage unit, for a Jet-Pac storage container, and for a new type combination sink, dishwasher and sterilizers for the Navy;

*Horkey-Moore Associates*, a contract for development, production and testing of stabilization equipment for ballistic escape system for *North American Aviation's* B-70 Valkyrie bomber; *The Garret Corp., AiResearch Industrial Div.*, an order for small turbochargers for Continental Motors' diesel engine. *The Rucker Co.*, an *Aerojet-General* contract for structural test fixture for simulation of stresses in initial launching period of Polaris missiles.

## 30 Years with Hyster

A 30-YEAR PIN for service to Hyster Company was awarded recently to **Art Alexander,** right, by **Philip S. Hill,** executive vice president of the Portland firm. Alexander, district tractor equipment representative for California, Nevada, Utah, Hawaii and Southern Oregon, joined Hyster in 1929 as an assembly department employe. Hyster, manufacturer of lift trucks and other products, celebrated its 30th anniversary earlier this year.

### *Denver, Rio Grande Trains May Use Gilsonite Fuel*

FRUITA, COLO.—Diesel fuel made from the solid hydrocarbon, Gilsonite, may power trains of the Denver and Rio Grande Railroad if tests now being conducted work out, according to *Lee Morris,* manager of the American Gilsonite Refinery near here.

The Rio Grande project, he said, is one of many being pushed in an effort to find markets for products from the unique plant, the nation's only refinery producing petroleum products from a solid hydrocarbon.

The Gilsonite is mined at Bonanza, Utah, and transported in sludge form by pipeline to Fruita where it is processed.

### Varian Plans More Expansion Next Year

PALO ALTO — Expansion plans announced for 1960 by Varian Associates call for the first unit of a radiation division building, the start of an administration building and a cafeteria.

This year the electronics firm has added to its instrument building, tube research and development facilities at Stanford Industrial Park.

### New Seattle Warehouse

SEATTLE — A warehouse and distribution center scheduled for occupancy this month, will be the first pre-colored, all-steel building erected in the Pacific Northwest. The facility, leased by The Blue Bell Potato Chip Co., is a Stran-Steel building located at 7800 Seventh Ave. S.

### Computer Consultants

GARDENA, CALIF.—Marc Shiowitz and Associates, electronic computer consultants, have leased 12,000 sq. ft. at 12838 Weber Way, Hawthorne, Calif.


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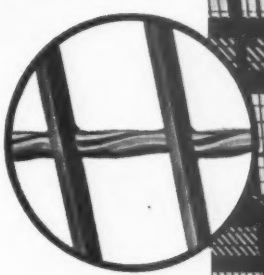

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# Laboratory Heads Discuss Research Service

WAYS AND MEANS to provide better research and testing service for industry was a principal convention topic when the American Council of Independent Laboratories met in San Francisco last month. Here you see a group inspecting a tensile strength testing machine at the Abbot A. Hanks laboratories. From left they are **Hugo de Bussieres,** president, Curtis & Tompkins, Ltd., San Francisco; **Cecil M. Shilstone,** New Orleans, Council president; **Herbert D. Imrie,** president, Abbot A. Hanks, Inc., and **Frank W. Barley Jr.,** president, American Spectographic Laboratories, Inc., San Francisco.

## Second Epsco-West Unit under Construction

ANAHEIM, CALIF.—Second unit of a new facility for Epsco-West is now under construction at 240 E. Palais Rd., where the first unit was recently occupied. The complete structure will provide 40,000 sq. ft. for design and manufacture of data control systems and related products.

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## Babcock Relays Plant Will Double Facilities

COSTA MESA, CALIF. — Babcock Relays, Inc. broke ground recently for an electronic relay plant that will double previous manufacturing facilities. Located on a site adjacent to Monrovia Ave., the new plant is scheduled for late January occupancy.

## *Lockheed Develops Air Traffic Control System*

LOS ANGELES—A new method of air traffic control that is matched to higher speeds and increasing traffic of the jet age was revealed here recently by Lockheed Air Electronics and Avionics Division.

The system, called LOCTRACS, can automatically tell ground controllers the location, identity and altitude of every aircraft in flight throughout the continent.

Installed nation-wide, the system would enable controllers to watch any aircraft, day or night in any kind of weather, providing location information 600 times a minute and altitude and identity data 35 times a minute.

The system is based on continuous, automatic transmission of coded signals on the same frequency from small, lightweight transmitters carried in every aircraft. Transmitters operate with a ground network of four receivers for each LOCTRACS sector, plus observation centers as needed.

## Highly Automated Sawmill for Cascades Plywood

REEDSPORT, ORE. —The sawmill currently being erected here for Cascades Plywood Corp., a $300,000 facility, is said to be the most automated of its kind in this state. A Mater Machine Works, Inc. installation, it will require but nine workers to produce 20,000,000 ft. of eight-foot studs each year.

In the facility, logs will be carried into the mill, onto the carriage and through the saw automatically, with the sawyer pushing buttons. The automated material handling system will stack them in piles four feet high and four feet wide.

The new plant is adjacent to Cascades green veneer plant here.

## Warren & Bailey Buys NW Rubber Supply Firm

PORTLAND — Warren & Bailey Corp., Los Angeles, has purchased the Goodyear Rubber & Asbestos Co., 205 N. W. 5th Ave., supplier of rubber goods and power equipment. Goodyear will be consolidated under that name with Harris Supply Co., purchased by the Los Angeles firm in 1956.

*Lloyd F. Childers,* former Goodyear executive, is president and general manager of the company under the new ownership.

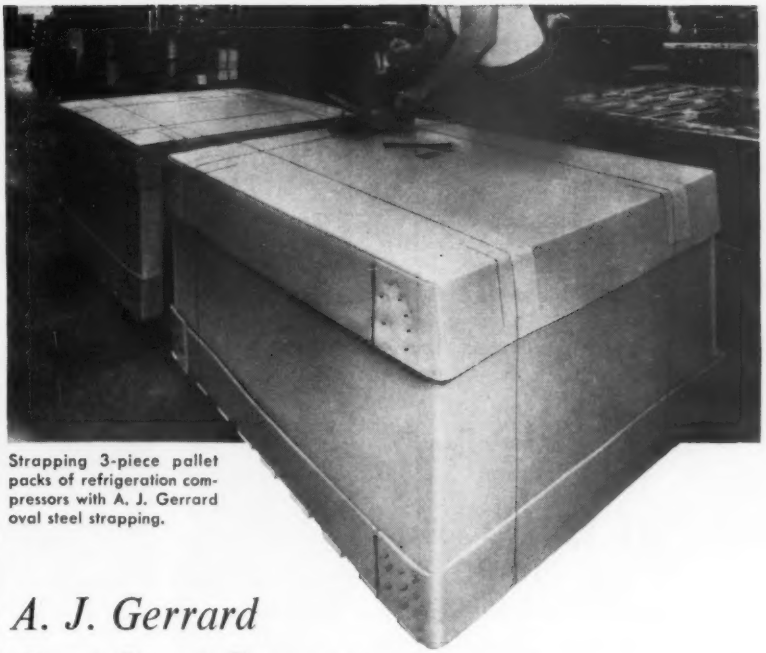
## Monsanto Acquires Options on 450 Acres in California

SANTA CLARA, CALIF. — Options on 450-acres of potential industrial property near Oxnard, Calif., have been acquired by Monsanto Chemical Co. At least four tracts are involved in the property which includes more than a mile of Pacific shore line and is about 60 miles north of Los Angeles.

No plans for use of the site were disclosed by Monsanto, which currently operates plants here and in Avon and Long Beach, Calif. The firm also has a plant and laboratory in Seattle and sales offices there, in Los Angeles and San Francico.

## Canco Hawaiian Division

HONOLULU—American Can Co. has dissolved its subsidiary, American Can Co. of Hawaii, and will operate its seven manufacturing units in this state as the Hawaiian Division. *A. T. Augensen* is vice president and general manager of the unit, which employs more than 250 people, with a payroll of some $1,200,000 annually.

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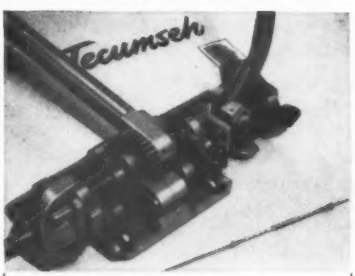


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**K. Strother**
White Motor

**D. Williams**
Fibre-Metal

**I. Paterson**
Eitel-McCullough

■ *M. W. McAuliffe* has been named by the Pyromet Co. as San Francisco Bay Area sales representative for the South San Francisco brazing and heat-treating concern. Before joining Pyromet, McAuliffe was manager of the cold finished bars and tubular products department of Joseph T. Ryerson & Son, Inc.

■ *Robert H. Raymond* has been named aluminum products manager by Reliance Steel and Aluminum Co., warehouse distributor for Kaiser Aluminum in Southern California.

■ *K. P. Strother* has taken over as Portland branch manager for the White Motor Co., replacing *H. D. Collins,* who has been named to a similar post at the Chicago branch. Strother has been with White since 1951, recently territory manager for Los Angeles and for Northern California. Collins, a White employe since 1949, has been in Portland since 1953 after serving in the Kansas City region.

■ *Ben Beveridge* has been appointed chief engineer by Reliance Magnesium Co., Los Angeles, distributor for Dow magnesium wrought products, as well as steel and aluminum.

■ *William O. Laande* has joined Packard Bell Electronics as liaison engineer, with an office in Seattle. A former engineering rep and Boeing Aircraft instrumentation specialist, he has also been associated with Ampex Corp. and with the CAA in Texas and in the Northwest.

■ *I. B. Paterson,* safety engineer, has recently joined Eitel-McCullough, Inc., San Carlos, Calif., manufacturer of electron-power transmitting tubes. Previously Paterson was safety engineer at Workmen's Compensation Insurance Co., San Francisco.

■ *Fred C. Murdock* has been transferred by Westinghouse Electric Corp. from Emeryville, Calif. to Salt Lake City where he will be manager of the manufacturing and repair plant. He succeeds *Gerald M. Ireland,* who has been in that position since 1947, and will now be in Emeryville. Another Westinghouse appointment is that of *Hugh M. Fellows* as defense products representative for the Intermountain district, headquartered at 235 West South Temple St.

■ *Ted J. Carrell* has been promoted to the position of engineering manager for Parker Seal Co., a division of Parker-Hannifin. Carrell was formerly with the firm's sales engineering staff.

■ *Dr. Steward Flaschen* has joined Motorola Semiconductor Division, Phoenix, as staff scientist, to direct studies in solid state chemistry pertinent to semiconductor surfaces and development of advanced techniques for improving product performance.

■ *Edward G. Cahill* has become Northwest district sales manager for Aluminum Company of America at Seattle, succeeding *Harold A. Faisst,* who was transferred to Philadelphia. A 29-year Alcoa veteran, Cahill has been assistant district sales manager for the company at Cleveland since 1954 after serving in other Alcoa positions. The firm's Northwest sales district includes branch offices at Portland, Spokane and Boise.

■ *D. W. Moore* has been named by Electrosolids Corp., Panorama City, Calif., as chief engineer, with responsibility over all products developed by the firm. Moore has been senior project engineer for the last two years and has an extensive background in electronic systems engineering at General Electric, Industrial Electronics and Pacific Semi-Conductors.

■ *David Williams* has joined the sales department of Fibre-Metal Pacific, Inc. of Bell Gardens, Calif., to cover the San Francisco Bay Area. Before joining Fibre-Metal Pacific this fall he was with Liquid Carbonic Co. in that area covering both industrial and medical accounts.

■ *Russell J. Jameson* has joined Dalmo Victor Co. as manager of the methods and industrial engineering department. He has been associated with Foote Brothers Gear & Machine Corp., Chicago for the last 12 years, and before that was with Eversharp, Inc., Chicago.

■ *Ted A. Rohlfsen* has been appointed by Oakite Products, Inc., as South Pacific Coast division manager, succeeding *J. C. Leonard* who is retiring after 35 years with the firm. Rohlfsen joined Oakite in 1947 as technical service representative in Los Angeles. In his new post, he will direct activities of 14 such representatives in Southern California.

■ *John W. Hawley* has been appointed manager of the product development department at Chemtrol, Lynwood, Calif., manufacturer of plastic piping systems equipment. He was formerly a special sales representative of the plastic pipe and fitting division of U. S. Rubber.

■ *W. Ray Junk* has been appointed director of product development for California and Hawaiian Sugar Refining Corp. A C & H employee for 30 years, Junk has been with the firm's sales department since 1938, most recently as manager of the industrial service department.

■ *Edward Chapman* has joined Hydro-Aire Co., a division of the Crane Co., as sales engineer, representing the company's new Hytrol braking system for trucks and trailers. He will cover 11 Western states and be based in the Los Angeles area. Chapman was previously employed by Ford Motor Co. for 10 years in various phases of truck marketing.

■ *Ronald S. Greenslade* has been selected as manager of the electronics department, tactical weapons systems operations, at Aeronutronic, a division of Ford Motor Co. Formerly with the Denver division of the Martin Co., Greenslade was also associated for eight years with Autonetics.

■ *Harold A. Ziegler* has been advanced to vice president and assistant general manager of General Conveyor, Inc. of Northern California, succeeding *B. P. Sandsto*, who is returning to Norway. Ziegler has been with the company as sales engineer and has extensive experience with material handling engineered products and their installation.

■ *Robert E. Deshon* has been appointed general manager of Perry Kilsby, Inc., distributor of carbon, alloy, stainless, aluminum and PVC tubing. Previously with Western Nipple Mfg. Co., an affiliate, as general manager, he has also been connected with the Republic Supply Co. in San Leandro.

■ *Charles F. Ricker* of the E. B. Field Co., Oakland, has been elected president of the Northern California Chapter of the Society of Industrial Realtors. Also elected were vice president *James H. L'Hommedieu*, of Lovegren and L'Hommedieu, San Jose; and secretary-treasurer, *Hunter S. Robbins*, Jr., of Robbins and Ritchie, Oakland.

■ *A. H. Weinert, Jr.*, has been named manager of the Los Angeles division of Drake Steel Supply and *Art Robinson*, manager of the flat rolled products division. Both appointments were announced by *A. H. Weinert, Sr.*, president, following Drake's recent merger with Zurbach Steel Co. of California.

■ *Warren Bassett* has joined Electric Steel Foundry Co. of Portland as manager of sales for the aircraft-missile industry in the Southwestern sales district, headquartered in Los Angeles. Bassett has been active in alloy steel development work in that field in the Los Angeles area for he past several years.


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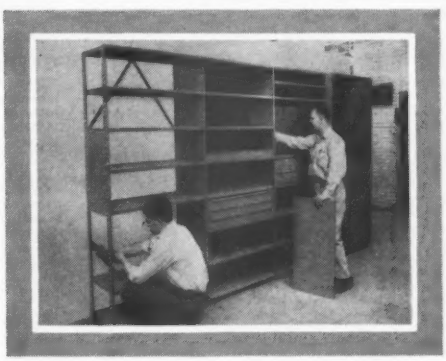

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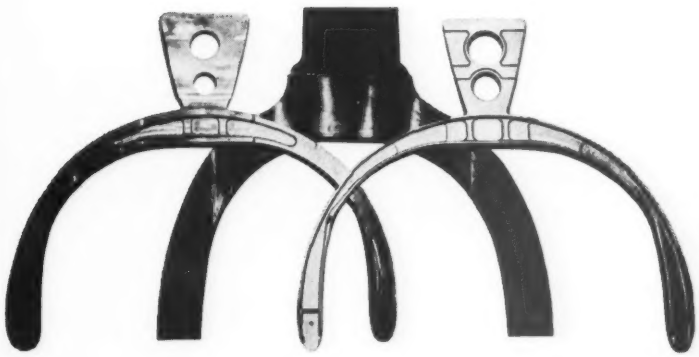
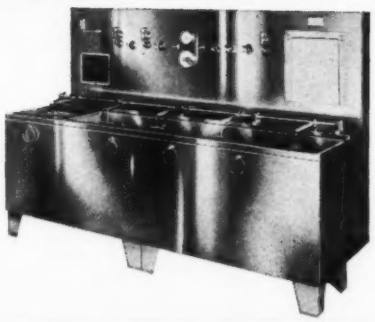
**Nacelle engine mount for Convair B58 Supersonic bomber** is largest forging of Type 17-4PH stainless steel ever made—forged weight 1200 lb approx, machined weight 30 lb. Mounts were forged from Type 17-4PH stainless billet because of its great strength, machinability, and resistance to corrosion. Forged by Ladish Pacific Division of Ladish Company, 3321 East Slauson Ave., Vernon, California, and machined by Airtek Dynamics, Inc., 2222 South Figueroa, Los Angeles, for Convair, Ft. Worth. Stainless steel supplied by Ducommun.





**Type 316 stainless steel** was selected for this photographic processing equipment because of resistance to corrosive photographic chemicals, ease of forming and welding, and attractive appearance. Manufactured by Carr Corporation, 1101 Colorado Blvd., Santa Monica, California, this photographic film developer is a mechanically agitated 70 mm reel type. Stainless steel supplied by Ducommun.

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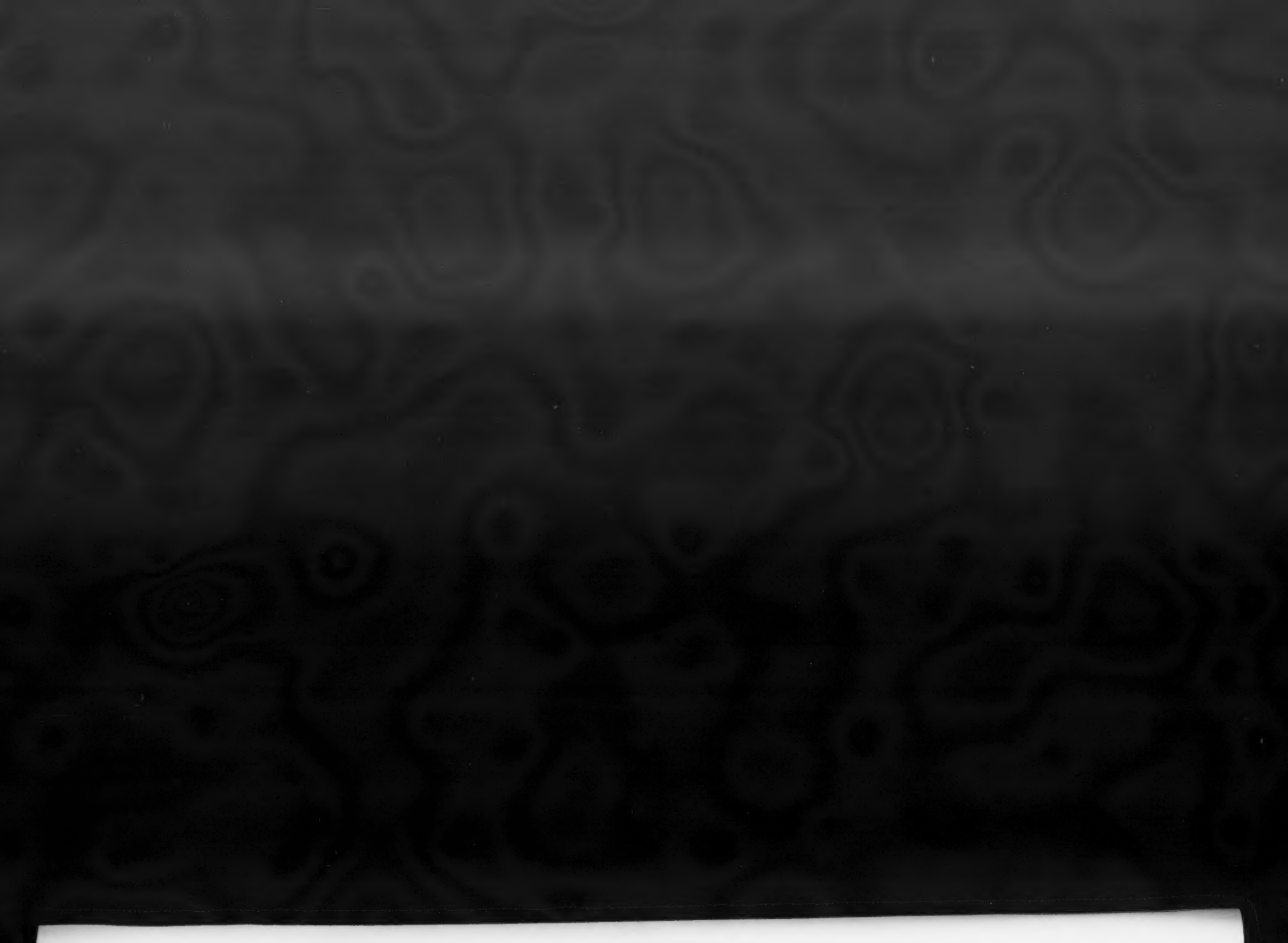
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